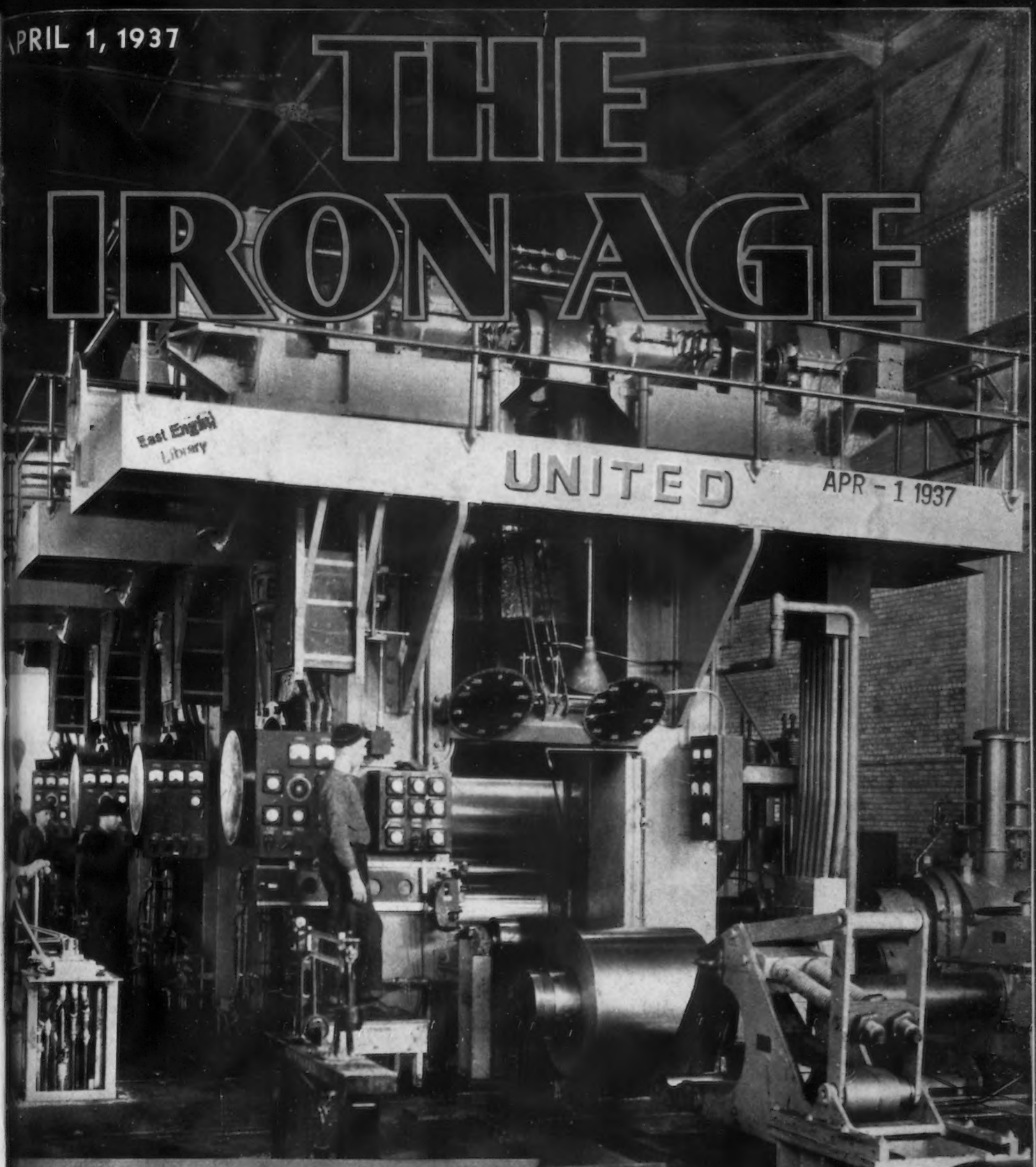
APRIL 1, 1937

THE IRON AGE



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THE IRON AGE

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APRIL 1, 1937

ESTABLISHED 1855 Vol. 139, No. 13

Time to Change the Medicine

THE American public is getting at this time an intensive and rather costly object lesson in theory versus practicality.

We have been spoon fed, for five years, on the theories concocted by professorial minds as to human conduct and relationships. The collegians have mixed the dose and the politicians have manipulated the spoon. A large part of the public has swallowed the mixture willingly, because it has been liberally mixed with sugar in the form of cash and promises. Those of us who thought it was an emetic, rather than a tonic, have been subjected to forcible feeding.

What has gone down is now beginning to come up in the form of the most violent eruption of discord and disregard for law and order that this country has experienced since the Civil War. When and where it will end and at what cost, no one can foretell. Certainly it will not end so long as those in power continue to give us the same medicine that has caused the trouble.

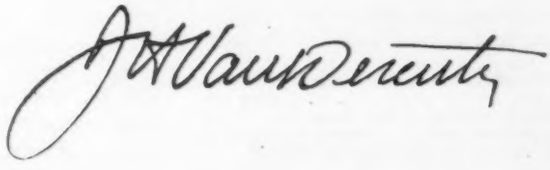
We have no quarrel with the New Deal's diagnosis of our economic ills, we do have with its treatment of them. All of us may agree with the belief that labor should have more purchasing power; but a dose of medicine in the form of wage rises resulting in price inflation is not the way to achieve it. Many of us will unite in the belief that labor should be permitted to raise its voice in collective bargaining through such agencies as it chooses, but when labor's voice becomes that of a dictator which renders State or Federal laws and courts impotent, the medicine is causing inflammation.

Inflation is a disease that is uncomfortable but not often fatal. Inflammation of class hatred, unless promptly checked, will bring the body politic to its death bed.

The time to stop the fever of inflammation is when it starts. And it can not be successfully treated by political "Coueism."

We would have no "sit downs" in our country today if the Governor of Michigan had enforced the law in Flint. We shall have more of them than ever, now that, in the Detroit emergency, law and law enforcement have virtually been declared incompetent by the Governor by his passing the job to John Lewis of removing trespassers from private property.

It is time to change the medicine.



Metallurgical Problems of Welding*

By DR. ARMAND DI GIULIO
Metallurgist, Ford Motor Co.

o o o

THE very wide application of welding in the automotive industry has been dictated by sound engineering principles. First of all, welding joins parts into one whole, thus adding strength and eliminating rattle and wear. Second, welding reduces unnecessary weight. Third, the use of automatic welding machines has reduced or eliminated the human factor, and consistently good welds can be obtained. Fourth, welding has materially reduced the cost of production.

The extensive use of welding in the Ford V-8 may be shown by the following figures: in a Tudor sedan, there are approximately 3800 welds in the body and chassis exclusive of the welds in component parts such as horns, generator and lamps. Of all these welds 92 per cent are spot weldings, 3 per cent arc weldings, 2 per cent oxyacetylene weldings, and the remaining 3 per cent is made up of resistance butt-weldings and seam weldings. These figures, however, do not actually give a true comparison between the various welding processes because they are based on number of welds and not on inches of surface welded.

The various welding processes may be grouped in two classes: those processes in which the metals are heated well above their melting point, and their union brought about in the liquid state; and those processes in which the metals are heated to the plastic state and in which the application of pressure causes the union to take place. The first class of welding includes the following processes: (1) gas welding, (2) electric arc welding, (3) brazing, and (4) thermit welding, the difference between the processes being the source of heat.

*Condensed from a paper presented by Dr. Di Giulio on Feb. 12 before the Detroit Section of the American Welding Society and the Detroit Chapter of the American Society for Metals.

Underlying Metallurgical Factors

Without entering into a detailed description of each of these processes, we may consider the metallurgical factors upon which depend the quality of the weld. The heating of the metals above their melting points, and subsequent cooling, results in a sequence of conditions in which the chemical and physical properties of the metals undergo marked changes. In the automobile industry, we are concerned mostly with the welding of steel, and, in order to understand what takes place when two pieces of steel are welded, we must refer briefly to the iron-carbon diagram of Fig. 1. If we consider a steel containing 0.4 per cent carbon, the cycle of changes during welding may be summarized as follows: In the annealed condition, this steel consists of ferrite and pearlite in about equal proportions. The carbon present in the steel is only slightly soluble in ferrite, and, at room temperature, is present in the cementite of the pearlite. When this steel is heated to the eutectoid temperature of about 1335 deg. F., the pearlite becomes unstable and transforms into austenite. In this phase, carbon goes into solution to the extent represented by point E corresponding to 1.7 per cent. Ferrite also begins to transform into the non-magnetic phase, and upon reaching the $GS(Ar_3)$ line, changes into austenite.

Further increase in temperature within the region of austenite results in an increase in the grain size until the line JE is reached, at which point melting begins. Within the area JE and BC, melting continues until a point on line JB is reached (about 2700 deg. F.) where the austenite decomposes into delta iron, plus liquid. Above line ABC, the alloy is totally molten. Reactions between the metal and the slag, and between the metal and the gases present, take place primarily when the metal is in the molten state. These reactions are very similar to those which take place in the open-hearth furnace and are responsible for the chemical changes which occur both in the electrode and in the metal to be welded.

When cooling begins, a reverse process to the one described takes place.

Oxidation to Be Held to Minimum

Numerous researches have established the fact that all the possible sources of heat used in fusion welding cause oxidation. Therefore, care must be taken in order to minimize this effect. For instance, carbon may be oxidized to the extent of 50 per cent of the original amount in steels containing from 0.25 to 0.48 per cent carbon. The amount of carbon "burned" depends primarily upon the type of electrode used and on the nature of the atmosphere surrounding the weld. Of the other elements present in steel, silicon

in the Automobile Industry*

is easily oxidized; next is manganese. The gas content of the deposited metal is also affected by the nature of the electrode. A bare electrode, for example, deposits about 0.3 per cent oxygen and about 0.12 per cent nitrogen, whereas a shielded arc electrode will deposit material containing about 0.06 per cent oxygen and 0.018 per cent nitrogen. Of course, in gas welding, the type of flame used will greatly determine the amount of gas left in the weld. In general it may be said that stronger and sounder weldings are produced with shielded electrodes.

In any fusion welding process, heating is accomplished at a very rapid rate and in a relatively small area. Consequently, due to the thermal conductivity of the metal, there is present a temperature gradient which covers a zone extending from the melting point of steel at the weld to a point unaffected by the heating. On cooling, heat is dissipated from the central part of the weld at a faster rate than from the outer portions. It is within this uneven temperature zone that all the changes illustrated by the iron-carbon diagram take place at a very rapid rate. Equilibrium conditions are not reached. Therefore, the structure of the weld and of the metal adjacent to it show practically all of the stages of transformation for the steel involved.

To see what takes place, let us examine under the microscope a typical arc weld. A sample was taken from the weld of a Ford front radius rod made from flat steel of a composition similar to S.A.E. 1040 rolled into a tube. The tubes were next placed in a continuous arc welding machine in which the seam was welded at the rate of about 1 in. per sec., using an electrode of the following composition: C, 0.10 maximum; Mn, 0.20 maximum; S, 0.02 maximum; P, 0.03 maximum.

The photomicrographs, Fig. 2, show the structure of a cross-section of the weld. At *D* it can be seen from the structure of the high-carbon steel, that the cooling was very fast because the transformation from austenite to ferrite and pearlite has produced a very fine pearlite surrounded by ferrite. If the cooling had been slower, the temperature of transformation would not have depressed and the resulting pearlite would have had more of the appearance of the conventional plate-like structure, easily recognized even at a low magnification.

Gas welding finds only a limited number of applications in the production of the 1937 Ford. These

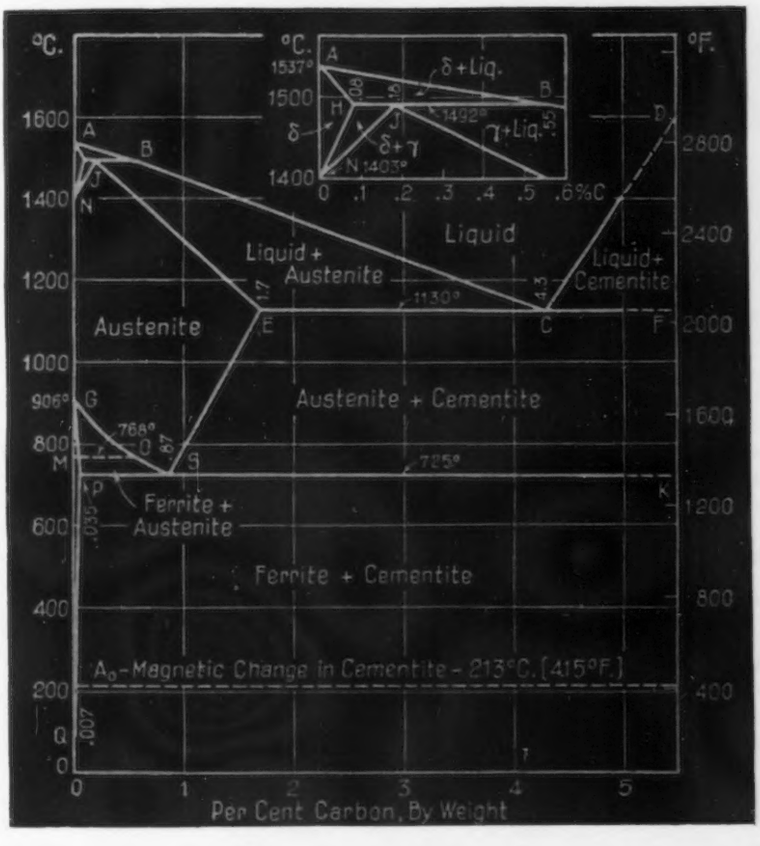
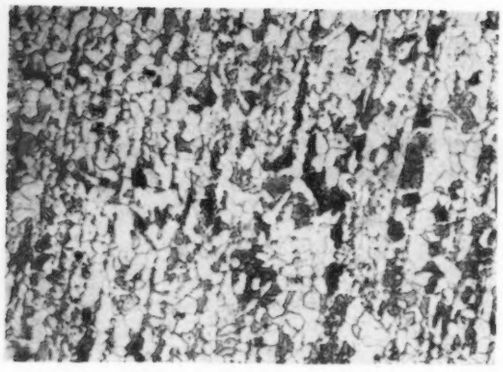
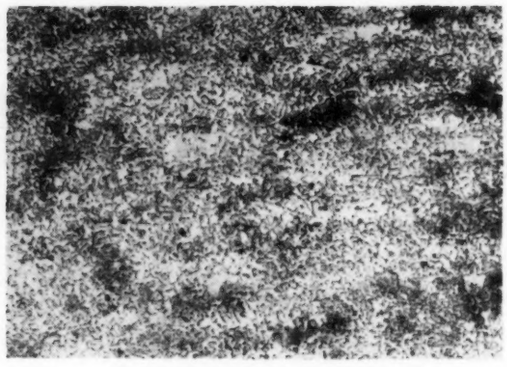


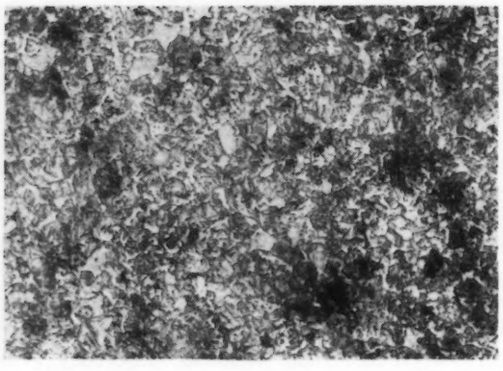
FIG. 1—Iron-carbon diagram.



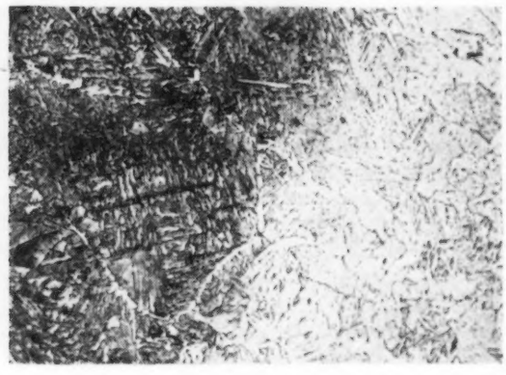
2A



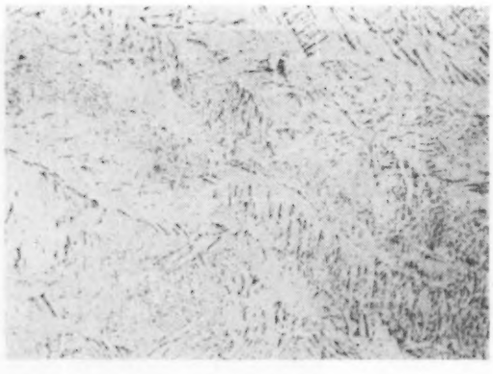
2B



2C



2D



2E

FIG. 2—Structure of a cross-section of a weld in a 0.40 carbon steel tube. (A) Typical structure of hot-rolled steel in unaffected zone. (B) Zone which was heated not much above the point where recrystallization takes place. (C) Zone heated high within the austenitic range, where large grains were produced upon cooling. (D) The weld itself, with the higher carbon tube material at left and low-carbon steel of the electrode at the right. (E) Electrode material in the as-cast condition, with large columnar crystals. (Magnification, 500x)

are to be found mostly in joints between the body proper and the floor panel, and in places where it would be impossible to use other welding machines.

Resistance Welding Important in Auto Industry

Pressure-resistance type of welding is the one which finds its greatest application in the automobile industry. The resistance type of welding is by far the most important for the automobile industry because of its extensive application and the large capital invested. Its greatest advantages are: (1) a smoother finish, and (2) a quicker and more flexible method of fabrication of assemblies. In this class of weld, the parts to be united are brought to the plastic stage by the passage of electric current, and the exertion of mechanical pressure helps cause the union of the parts. It has been stated that the heavy localized heat and pressure cause recrystallization of the metal followed by grain growth which permits the grains to grow together. Heavy localized pressure on a small area will provide the strain necessary for recrystallization.

Resistance-butt welding consists in gripping the pieces between two electrodes or "jaws" and in pressing the parts together while the electric current causes heating at the surface of contact. The heat generated is high enough to bring the metal to a plastic state and with the proper pressure very good welds are obtained. In some applications, the pressure is so regulated as to produce an arcing effect which results in a flash welding. Resistance-butt welding finds only a limited number of applications in the making of the Ford V-8, but it is used on im-

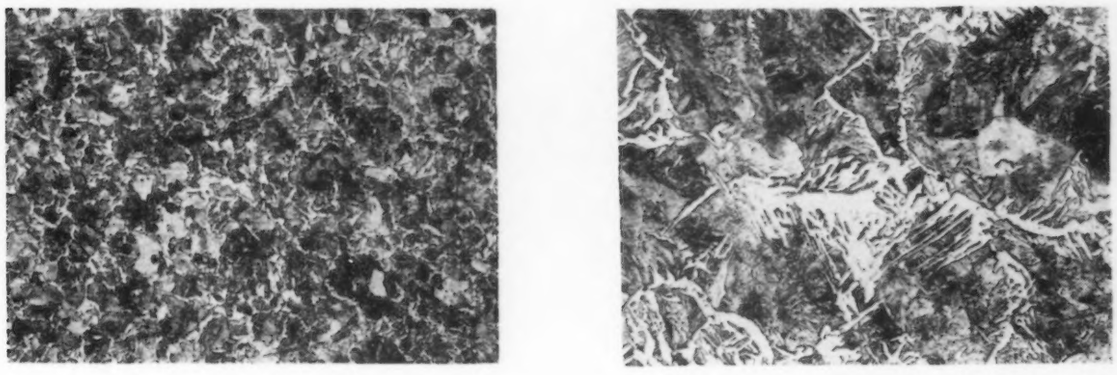
portant parts such as welding of the front radius rod feet, and welding of the left and right members of the radius rod.

The so-called right and left foot are forgings made of steel similar in composition to S.A.E. 1040. These forgings are given a quench and draw treatment before being welded. Both static and fatigue tests are performed daily to ascertain that the weldings do not in any way impair the desired physical properties of the assembly.

such as the hood hinge bracket base to the retainer, the headlight unit retainer to the front fender, and the rear reinforcing assembly to the hood top.

Seam welding may be considered as a series of overlapping spot welds. A typical application of seam welding is in the construction of the gas tank which consists of terne plate welded in a series of stationary machines.

In spot welding, the pieces to be welded are placed between two electrodes whose tips are relatively small and a large current of low voltage is passed through. Heavy pressure is applied at the electrodes and, immediately after, the current is passed for a short interval of time, the pressure being maintained momentarily after the current has been shut off. In modern automatic welding machines, elaborate timing devices permit close regulation of pressure and current which assure welds of uniform quality. It would



3A 3B

FIG. 3—(A) Structure of 0.40 carbon forging after a quench and draw. (B) Structure of resistance butt weld between forging and tube of similar material. (500x)

The structure of a weld of this type is seen in the photomicrographs, Fig. 3. At *A* is seen the structure of the forging, while at *B* is seen the structure of the weld proper. Referring to the structure of the arc weld of Fig. 2, one can notice that there is a considerable difference between the structures of the two welds. In Fig. 3(*B*), the grains are well defined and much larger. It is evident that although the temperature at this weld was never as high as in the previous one, the mass of metal heated was such that cooling took place at a much slower rate. Hence, the transformation of austenite to ferrite and pearlite approached more nearly equilibrium conditions.

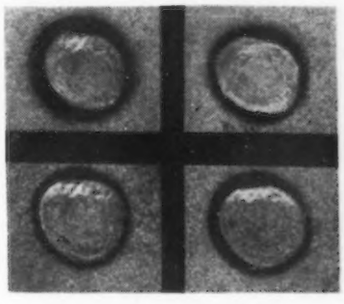


FIG. 4—Surface of spot welds made with new electrodes.

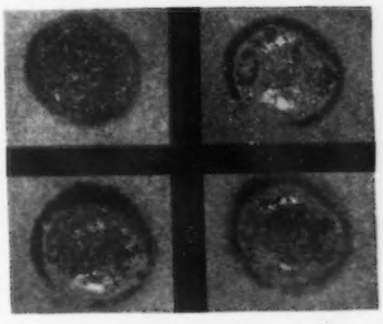


FIG. 5—Uneven surface of spot welds made with a "mushroomed" electrode.

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FIG. 6—Unetched section of a rough spot weld made with a mushroomed tip. (100x)

o o o

Spot Welding Most Used

Projection welding finds its application where small parts are welded together or to a larger piece. It can be used successfully for thicknesses up to ¼ in. In the Ford passenger car, applications of projection welding are found in various assemblies of the body,

be almost impossible to enumerate all the parts of the 1937 Ford which are joined by means of spot welding, but it constitutes by far the most used process of welding and its use is increasing continuously.

Proper Electrode Important in Spot Welding

The chief metallurgical problem arising in connection with spot welding is the choice of the proper electrode material having the following properties:

High electrical conductivity is required in order to decrease the resistance and to prevent over-heating at the point of contact. High thermal conductivity is necessary to keep the electrode tips as cold as possible. In most spot welding machines, water cooling is provided either by the use of hollow electrodes or by circulating water around them.

A combination of hardness, impact and wear resistance and retention of these properties are necessary, because with resistance welding in general, and primarily spot welding, the electrode must be able to withstand high pressure applied suddenly. It is necessary, therefore, that the area of contact between the electrodes and the pieces be constant. If the tip area becomes larger and uneven, the unit pressure becomes lower and a poor weld is obtained.

One can hardly overemphasize the fact that the electrode tip must be smooth and of uniform area to assure good welds. This point is illustrated in Figs. 4 and 5. Fig. 4 shows the smooth surface obtained when the electrode tips are kept in the proper condition, while Fig. 5 shows the surface of spots produced by "mushroomed" points. Not only the surface but the weld itself is affected as can be seen from Figs. 6 to 8.

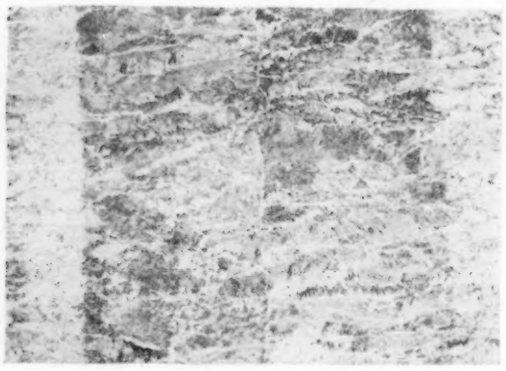


FIG. 7—Structure of a good spot weld. (100x)

FIG. 8—Structure of a poor weld, showing the recrystallized zone extending unevenly across both pieces of sheet steel.

Fig. 6 is a cross-section of one of the weld illustrated in Fig. 5. It is unetched to show what seems to be a tear in the metal, produced by the electrode tip sticking to the surface of the steel.

Fig. 7 shows the appearance of a good spot weld. There appears the coarse structure produced by the heat and the pressure. The line of the weld is visible and at both sides of it one may see the extent of the zone in which the highest temperature was reached. For the average spherical pointed electrode, this zone assumes the shape of an elongated ellipse whose major axis is parallel to the surface of the steel. Fig. 8 shows the structure at the weld of one of the spots of Fig. 5. Heat and pressure were not uniformly distributed. Consequently, the recrystallized zone extends unevenly across both pieces of sheet steel. Such a structure is an indication of a poor weld, a fact which is further proved by physical tests.

The requirements of electrode material are such that we are limited in our choice to non-ferrous metals and alloys. The operating temperatures in almost all resistance welding processes are such that copper electrodes are softened and become useless after a relatively short time. For this reason, and also because of the increased tendency toward higher working pressures, it became necessary to develop other alloys which could be satisfactorily substituted for the pure copper electrode. As a result, several alloys are now available whose electrical and thermal properties are not as high as those of pure copper but the other physical properties, especially hardness, are much better. Although their cost per pound is considerably higher, they have replaced copper electrodes almost completely because in actual service they are more economical due to their longer life. These alloys possess age hardening properties, that is, they can be hardened by heat treatment. However, even for these alloys there exists a temperature at which they become soft and care must be taken that, in service, this temperature is never approached.

Cast Electrodes Save Machining

In this connection, it is opportune to mention that the Ford Motor Co. has very successfully pioneered in the use of cast electrodes. These cast electrodes have proved to be as good as those made from bar stock, and the casting process has resulted in a considerable saving due to the reduced amount of machining. At the present, a small plant is entirely engaged in the preparation of resistance welding electrodes.

"Playing Safe" at Bethlehem Plants

HERE'S vigilance that's automatic. Note the wristlets and attached wire cords worn by the operator of this punch press machine, in the drop forge shop of the Bethlehem Steel Co.'s Bethlehem plant. Should this operator negligently leave his hand in the path of a descending punch the cord would become taut, jerking the hand away from the danger zone.

DOORWAYS at plants of the Bethlehem Steel Co. that are adjacent to tracks or roadways are equipped with "cat tails" to remind of possible danger from approaching yard engines or other equipment.

OPERATORS of pipe welding furnaces at the Maryland plant of the Bethlehem Steel Co., Sparrows Point, Md., wear "heat masks" constructed of fine-mesh wire screening. The fine screening checks the heat by absorbing it, making their work more comfortable and also safer.

HERE is a non-skid wheel barrow, the type now employed in many services by the Bethlehem Steel Co. The rubber tire takes the jolts and prevents the wheel slipping sideways when passing over tracks or other obstructions.

Rubber Lined Steel

FIG. 3—A portion of the completed line.

LARGE quantities of spent liquor must be handled at rather high temperatures in connection with continuous pickling operations such as accompany continuous strip production. Disposal of this liquor has been satisfactorily accomplished by means of rubber lined steel sewer pipe lines.

THOSE who have closely followed the development of modern continuous strip pickling methods during the past five years are well acquainted with the contributions which the rubber industry has made toward increasing the efficiency of this operation. First, the Vulcalock process which permits the bonding of rubber to steel with practically integral adhesion. Then Triflex—a three-ply acid-proof rubber lining combining the advantages of both hard and soft rubber and equipped with built-in expansion joints.

Five years ago the use of rubber in the pickling room was considered a daring experiment. Today, a check of outstanding strip mill installations will show practically a one hundred per cent acceptance of this material as a lining for tank and ventilating equipment.

Although the problems of leaking tanks, acid loss and fume disposal have been successfully solved, there still remains the important one of acid disposal. Many pickling operations, particularly continuous strip, present a problem in handling spent pickling liquor hurriedly and in large quantities. In most instances it is not practical to allow the acid to cool prior to emptying into the sewer. Since the uncooled acid ranges in temperature from 160 to 200 deg. F., it cannot be satisfactorily conveyed through ceramic pipe due to danger of cracking from thermal shock. Such a condition is naturally objectionable because of high maintenance costs and possibility of acid leakage at points where it is apt to cause undermining of building structures.

As pioneers in the use of rubber-lined steel tanks for strip pickling, engineers of the Inland Steel Co. were of the opinion that rubber might well be used for acid disposal service. In conjunction with engineers of The B. F. Goodrich Co., they set about to find ways and means of further utilizing this material.

They were successful in their efforts and as a result the Inland Steel Co. has installed at its Indiana Harbor plant during the past year an acid sewer line embodying an entirely new design. The sewer consists of approximately 650 ft. of standard 18-in. steel pipe with plain ends. Pipe is lined with Triflex rubber which extends out over either end and is carried back for a short distance on the outside.

The lengths of pipe are coupled with Flexlock rubber gaskets and rubber-lined split steel sleeves. This gasket, which is a recent Goodrich development, consists of a rubber ring having internal and external circumferential ribs which grip both the pipe and the sleeve. Each end of the pipe has a Flexlock gasket snapped over it and the gaskets are compressed to make a seal with the split sleeves. Side rubbers are inserted to furnish the necessary compression at the point where the two halves of the sleeves join.

The pipe is supported both at front and back of each joint as the Flexlock gasket is not designed to take a load but merely to act as a seal. After the line was installed it was tested with 20-lb. water pressure and showed absolutely no leakage.

In addition to resisting the severe thermal conditions of this service and thereby preventing failure due to cracking of the line, this construction offers a number of outstanding advantages.

The pipe is easily installed. It is only necessary to snap the Flexlock gaskets over the ends, place the lengths in their respective positions and bolt the split sleeve over the two pipe ends. At Inland, after the pipe was strung along the ditch, approximately 300 ft. of the 18-in. sewer line was laid in less than four hours.

The use of Flexlock gaskets permits joint flexibility as its construction is such that slight angularities in a line can be installed without fabricating special angle pieces. The joint will allow also for a rea-

Sewer Pipe Handling Acid Waste

By H. C. KLEIN

Chemical Sales Division
B. F. Goodrich Co.

o c o

sonable amount of settling in the line after installation.

No special provision need be made for expansion. When the pipe is installed a space of approximately ¼ in. is allowed between pipe ends. The Flexlock gaskets continue to seal, regardless of the expansion or contraction in the line.

The Triflex construction used in the pipe proper offers the desirable properties of both hard and soft rubber. It has the chemical resistance of hard rubber plus the desirable expansion and contraction properties of soft rubber. The built-in expansion joints prevent buckling or cracking of the lining in any one length of pipe.

With the use of ceramic pipe there was always the danger of its being shattered or cracked due to physical abuse. The rugged construction offered by steel pipe eliminates all such worries. However, it is an easy matter to replace an individual pipe length should the occasion arise. Due to the fact that a ¼-in. space is left between the pipe ends at time of installation, it is possible to remove a damaged length and insert a replacement without disrupting any other portion of the line.

This acid sewer line has now been in service for several months without any signs of leakage. As a result of this highly satisfactory performance, the owners feel confident that with this installation they have eliminated all problems of acid disposal for years to come.

Two other large strip mills have recently adopted this method of handling acid waste and the lines, one 1600 ft. in length and the other 610 ft., and are now in process of installation. Both lines are using 16-in. pipe.

FIG. 1—Lengths of steel sewer pipe with rubber lining installed.

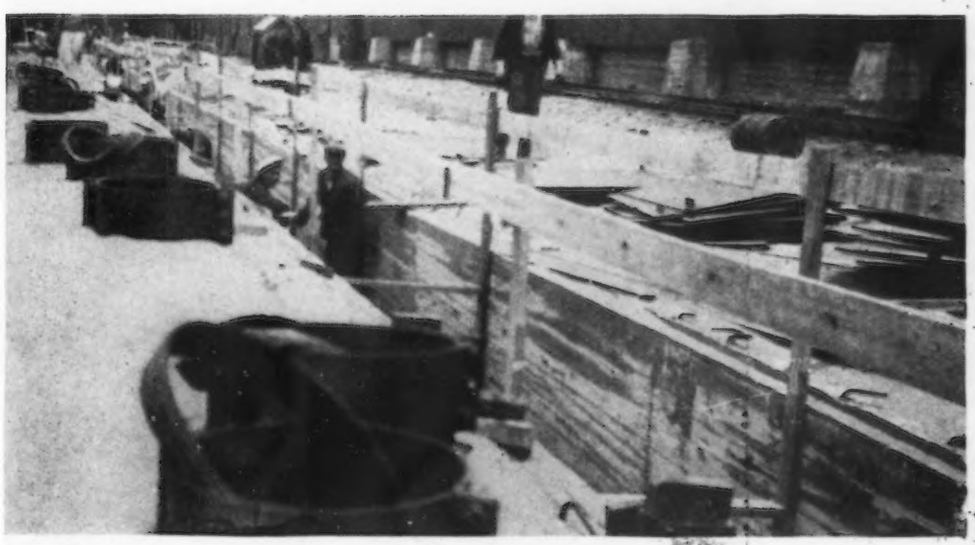


FIG. 2—Rubber sleeves and gaskets prior to installation.

The development of rubber-lined steel pipe for this service should prove of double interest to members of the steel industry. Not only does it clear away one of the final obstacles to efficient, low-cost pickling operations, but it opens up an entirely new market for steel pipe as well.

Why the Railroads Should Buy

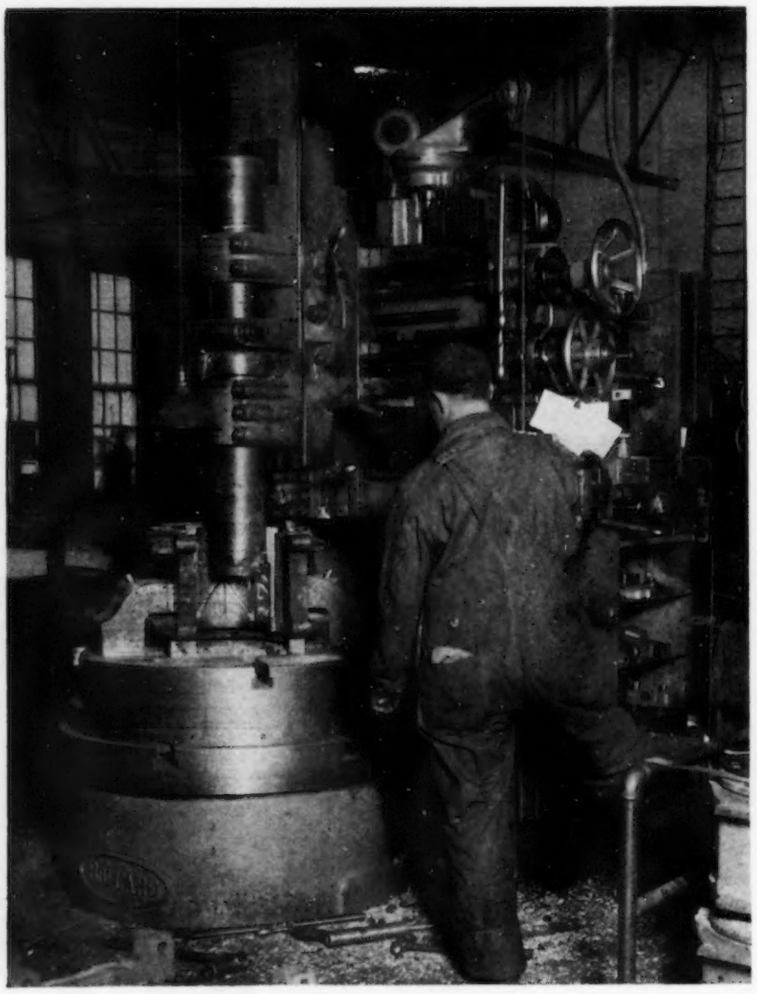
IN effecting economies or in increasing output, either in an industrial plant or in a railroad shop, modern equipment is necessary. Labor's effort and management's most perfect supervision can accomplish little without the proper tools with which to work. In the case of railroad shops, with equipment averaging more than 20 years in age, the much faster producing modern tools would obviously considerably shorten the machining time involved in making necessary motive power repairs.

The less time required for the repairing of locomotives the more time these revenue-producing units are available for profit-making service. With fewer locomotives on lines today than were in service during the early months of 1930 and with traffic nearing the level of that year, there is an increasing demand for faster repairing. Unless repairs are speeded up shortages of motive power may develop. That railroad management is conscious of the possibility of such a shortage seems definitely reflected from the heavy purchasing of locomotives during the last few months of 1936.

Many railroads not only need this new and more efficient motive power, but also need modern machine tools to adequately handle the repairing of it. Some roads that invested in heavier locomotives in the late '20's found, for example, that the new locomotives could not be repaired satisfactorily with the shop facilities at their disposal. During the depression a few of these roads had to spend considerable money for shop improvements —money that could have been used for operating purposes during those slack years. With the replacing of more and more of the old light power with heavier locomotives, it is logical to expect that other railroads will similarly find it necessary to re-equip their shops to service the new power satisfactorily.

This pressure replacement of incapacitated machine tools, either to speed up repairing or to adequately service the new power, will result in reducing costs. As the repairing of motive power accounts for 9 per cent of railroad operating costs, many dollars can be added to earnings through more efficient methods. Furthermore, with competition

SHORTAGE of locomotives is indicated not only by statistics, such as those included with Mr. Sterry's previous article, in THE IRON AGE of Feb. 11, page 34, but by the recent heavy purchasing of new motive power. The situation



THIS 42-in. driving box borer and facer machines 9 x 14-in. boxes at the rate of 10 min. per piece, floor-to-floor time.

Modern Machine Tools

By H. LEE STERRY
The Bullard Co., Bridgeport, Conn.

definitely calls for a speeding up of repairing.

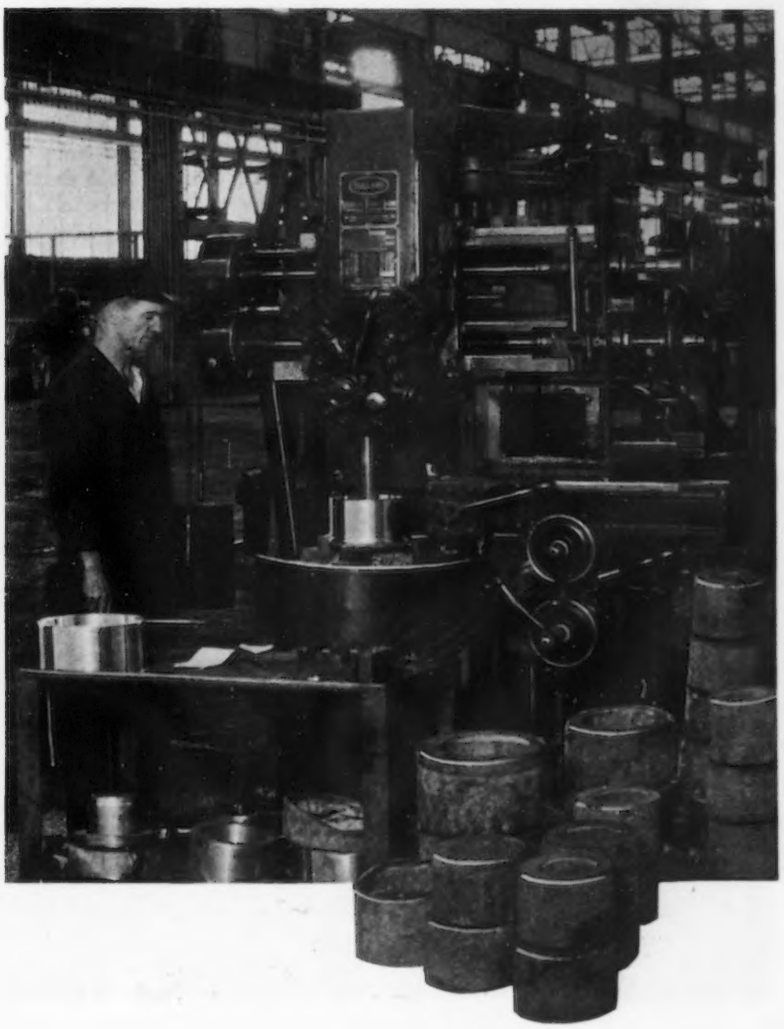
The role of modern machine tools in this, and in the servicing of the newer locomoti es, as well as in effecting economies in the cost of repairing, is discussed in this article.

in the handling of traffic increasing with both labor and material prices on the rise and with a more or less rigid rate structure to contend with, it is important that the greatest possible efficiency be attained in the maintaining as well as in the operating of locomotives. Thus, the replacement of inefficient machine tools will not only benefit profits by keeping revenue-producing units more actively engaged, but will increase profits by reducing the actual cost of repairing these units.

Only the repairing of steam power has been considered here because up to the present it has been mainly steam power with which the railroads have had to deal. There are relatively few electric and Diesel locomotives in service today so that their repairing problem is small in relation to the problem of repairing steam power.

Although modern machine tools can definitely assist the railroads in the various ways outlined above, it should be understood that the machine division of a locomotive shop is only one factor in the maintaining of power. Actually, the man hours of labor in the machine department of a locomotive repair shop are only about 18 to 22 per cent of the total man hours involved in classified repairs. Of this time from 50 to 75 per cent is directly machine time, the balance being bench work. Thus, as far as machine tools are concerned, only about 15 per cent of the labor involved in locomotive repairing is directly affected by them—a fact that would seem to indicate less need for installing modern machine tools than generally supposed.

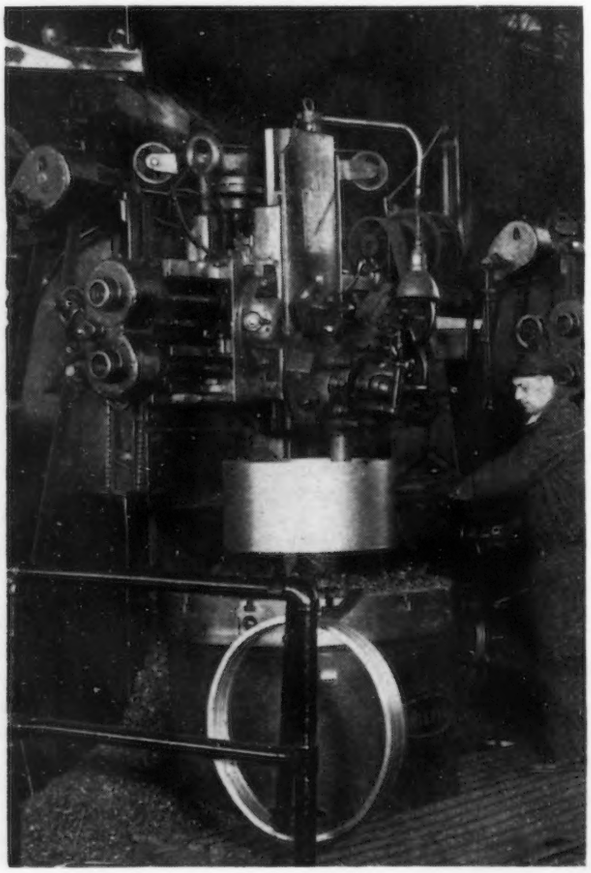
But so far we have considered only the direct savings, which are probably the smallest part of the benefits possible, since the speed of work done in the machine department of a railroad shop has a direct bearing on the speed of repairing in nearly all other divisions of the shop. Actually the total time of repairing a locomotive is governed to a considerable extent by the time of the longest individual job. The speed of repairing in departments other than the machine shop is controlled to a large extent by man power, but in the machine shop the machine is the controlling factor. Thus when the machine shop is operating at capacity, additional or



A 24-in. vertical turret lathe tooled for rapid machining of brasses.

better men are of little help in speeding up repairs. Modern machines must be purchased to replace the 20, 30 and 40-yr. old tools in active service to cut the time of this mum output per man is definitely needed.

With modern tools, better work can be produced considerably faster and by less experienced help than is needed with machines that must be pampered and coaxed along. Hence with modern equipment not only can repairing be speeded up but accuracies can be maintained and in some cases improved, and the difficulties of finding highly skilled workmen may be to a great extent alleviated.



AT LEFT

L-TYPE packing rings are machined in this set-up at the rate of 45 pieces per 8-hr. day. On plain rings, the production is 90 pieces a day.

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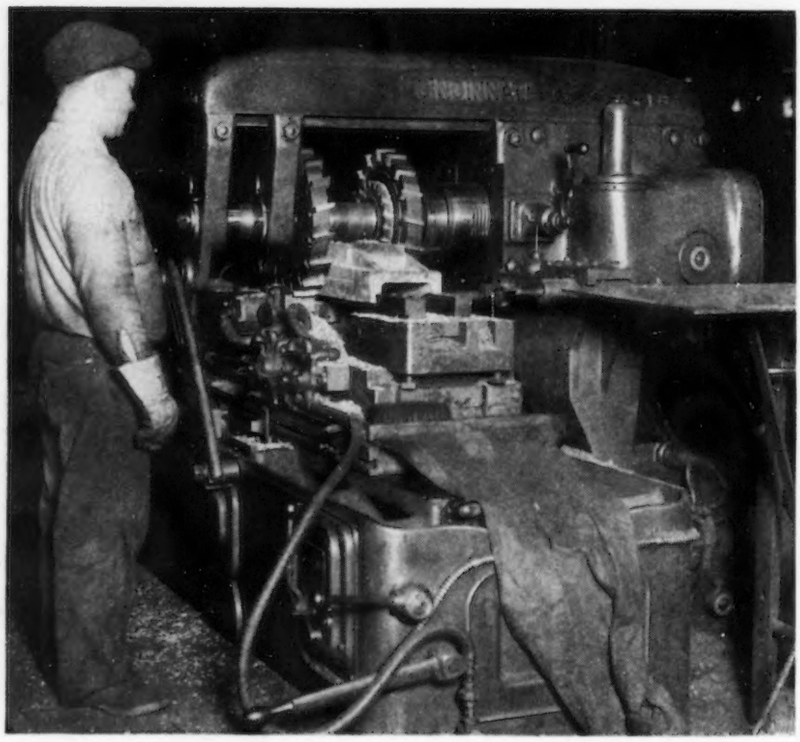
BELOW

PLAIN Hydromatic milling machine employed at the Lehigh Valley Sayre shops for finishing four surfaces of 31-in. x 8½-in. x 6½-in. bronze crosshead shoes in one operation. Shoes are finished in 8 to 10 min. each, giving an 8-hr. production of 48 to 60 shoes — with a cost saving of 75 to 80 per cent as compared with machining by the previous method.

These intangible benefits are greater today in the modern railroad shop, both in speeding repairs and in effecting economies, than they would have been a few years ago. The trend today is toward centralized shops as against the numerous small shops of 15 years ago; and this has been made necessary and possible through the use of heavier and more efficient motive power that is able to go more miles between shoppings. In principle all work now flows through the shop on a production basis and any delay in one department has a much more serious effect on the output of subsequent departments.

With the greater amount of repairing done in these centralized shops, there has been a greater departmentalizing of operations, and production scheduling systems have been installed. This makes the modern locomotive repair shop more of a production plant, with all the benefits, and also all the disadvantages, derivable from this production principle. With each repair job worked to a schedule and work and keep this department balanced with the effective output of the others.

Quality of work turned out by the machine department also definitely affects other shop operations. With the old machines and no pressure for fast repairing it is quite possible to do satisfactorily accurate work; but with time as an element and only old machine tools available, the work is less accurate, and considerably more time is required for fitting in other departments, hence slowing up all repairing. Of course, with a sufficient number of old machines and adequate man power, difficulties might not be experienced. During the depression, however, the railroads retired many worn-out and obsolete machine tools in abandoned shops, as they did motive power, and hence have not the same facilities they had available a few years ago. In addition, skilled labor is not plentiful today and therefore the maxi-



the activity of the entire shop tied together in this manner, a much more serious condition exists when one department cannot keep up. Operating with 20 to 40-yr. old equipment the machine department is extremely handicapped in its inability to increase output by only adding men.

The machine department is today much more of a parts production department than heretofore. Through a better understanding between the stores department and the shops and through greater standardization, new work is being produced in larger quantities in the main shop, stored and then shipped to outlying shops as needed. Much of this work can only be roughed out, with sizing operations done when fitted, but even so it is a source of time and money savings. Although these changes to larger quantity repair part production make for faster and more economical repairing even with the 20-yr. old tools in use today, still greater savings are possible through modern machine tools, which are more adaptable to this type of production.

Not all railroads have made these changes in their shop operating methods, but the trend is in this direction, and as the changes take place the need of modern machine tools will become more apparent.

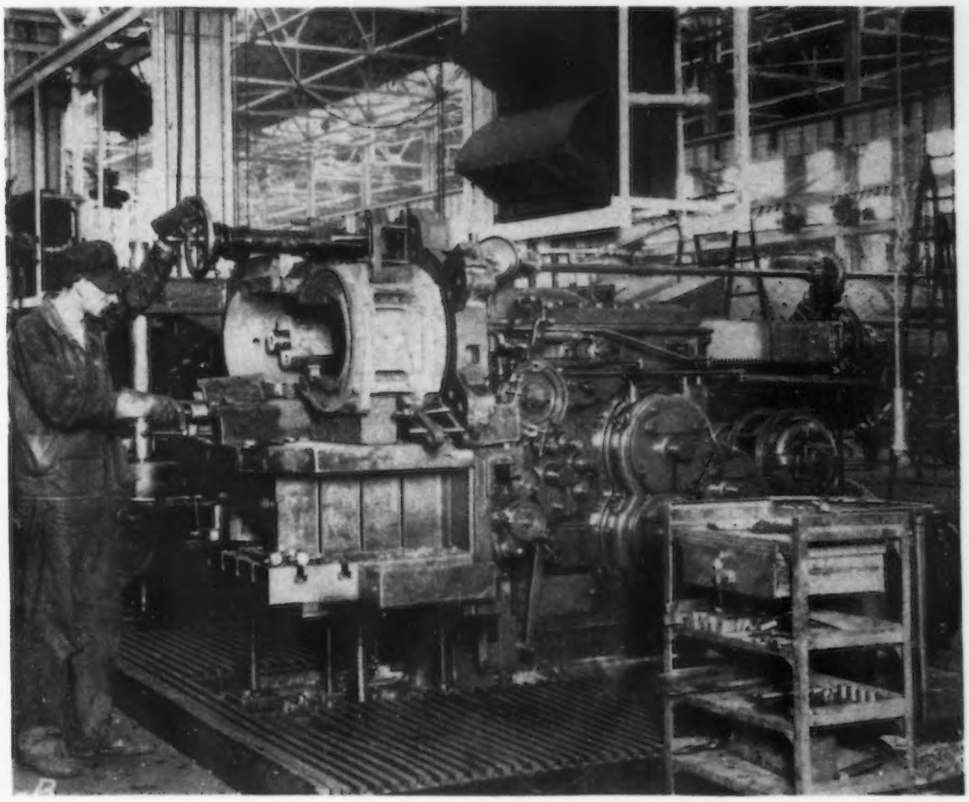
With machine tools a major factor in the speeding up of repairs and in cutting costs, the direct savings which make possible the indirect benefits outlined above may now be considered. It is impossible to state definitely that with the new tools 25 per cent more repairing could be done or that costs in general could be reduced a definite amount, because the effect of the new tools on the whole depends upon too many conditions. However, it is possible to cite economies made on individual parts through the use of modern machine tools.

In modernizing the Oelwein shops of the Chicago and Great Western, 135 old tools were replaced by 48 modern motor-driven machines and sufficient capacity maintained for all needs. In this case, 20 of the old tools, picked at random, averaged 31 yr. of age, which indicates to some extent why so few new machines were needed. The equipment was installed at the same time that other major changes were made in operating methods and in arrangement of the shop, so that the new tools had all the advantage of systemized operating procedure. In this case the rearranging of the shop and the purchase of modern machines was made necessary by the need of facilities to repair the heavier power purchased in 1930 It is perhaps an indication of what must be done by other railroads as the new power they are now purchasing is put into service.

Some of the savings obtained on individual jobs are quite outstanding. A modern 24-in. lathe reduced the time of turning piston rods and fittings from 6 hr. 20 min. to 3 hr. 30 min. because of the greater power of the new machine and the ability to machine the work at higher speeds and with heavier cuts. Another lathe, in the wheel shop, reduced the time of turning 9 x 12-in. axles from 8 hr. to 4¾ hr. In another case a 30-in. slab grinder used on a variety of parts resulted in a saving of about 80 per cent over previous methods.

At the Reading shops of the Reading Railroad, where the major part of this road's locomotive repairing is done, 49 old machine tools averaging 35 years of age

(CONTINUED ON PAGE 122)



A 36-in. draw-cut shaper machining a 14½-in. steel driving box. Production is at the rate of 16 boxes per 8-hr. day.

Modern Rolls

POURING a 15-ton heat of alloy iron into a roll mold.

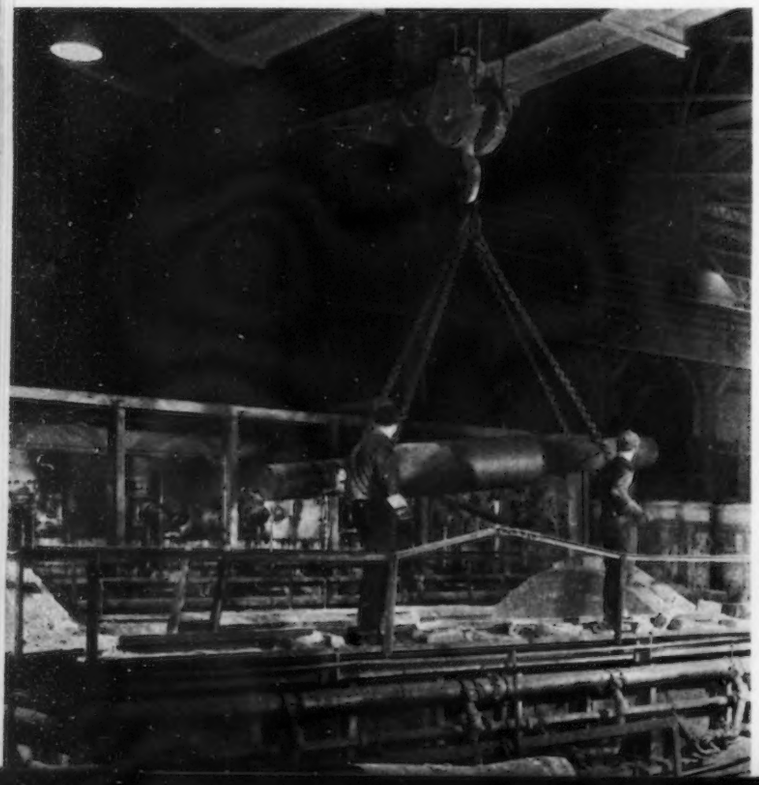
THE rapidly increasing acceptance of stainless and high-alloy steels in a wide range of markets has been responsible for significant changes in certain steel producing equipment. Both the mechanical and chemical processes of manufacture are the subjects of continuous experiment and research. New tools, new machinery, new chemical and alloy formulas are being introduced, which result in improved methods and improved equipment to meet the demands of producing this steel.

The introduction of stainless sheets and plates has resulted in certain definite changes in the technique of roll making. Roll manufacturers have not been slow in realizing the needs and problems which concerned their product. So the roll as a tool for specific use on stainless or alloy steels has been evolved. There are, of course, various types for various problems, but definite improvements have been made available in the modern roll.

There are three important steps which have been taken by roll producers in meeting the new conditions imposed by stainless and high-alloy steel rolling. They have introduced into the rolls alloys to provide greater strength for heat and stress resistance. They have increased resistance to firecracking and wear. They have provided a "mirror finish" on the roll surface to facilitate the production of a superior, flawless surface upon the finished product. These three factors each have brought a direct benefit to the producer. Upon analyzing the three steps, the resultant advantages will be made clear.

The first fact of importance to present a problem, is that the introduction of nickel, chrome, and other alloys necessary for the production of the alloy steels, increases the melting point of the metal. Consequently, the rolling temperature of the ingot or bloom delivered to the mill from the soaking pit is high. This, of course, subjects the rolls to a greater heat stress. On the other hand, it often is not possible to deliver the material to the rolls at a temperature high enough to prevent a decided increase in stress during reduction. If then, on such alloy steels, the old time carbon or even the semi-steel roll is used, mill operators are faced with new possibilities of breakage and wear. Reduction of drafts and an increase in the number of passes become necessary, and loss of efficiency results. The roll manufacturer has solved this problem by the first step; the in-

* All data and photographs used in this article were furnished by Pittsburgh Rolls Corp., a subsidiary of Blaw-Knox Co., Pittsburgh.



LOADING alloy iron rolls into a pit-type gas-fired heat-treating furnace.

for Modern Mills*

By C. E. HERINGTON

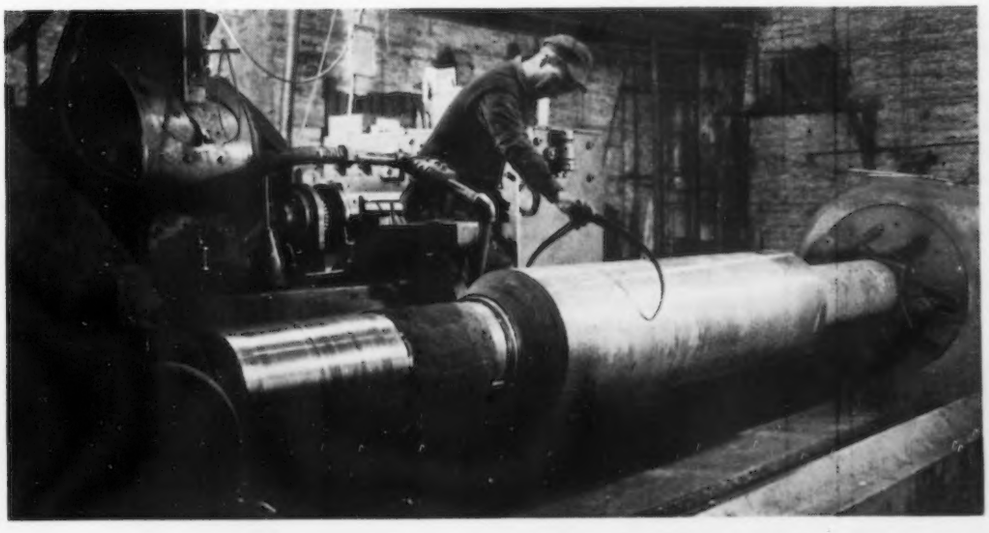
troduction of new alloys into the rolls. Although this step was necessarily accompanied by longer and more expensive heat treatments of the rolls in order to reap the full benefit of the alloys, in this way the roll maker has kept up with the introduction of new alloys in the production field and improved his product.

The second step, the increasing of resistance to firecracking and wear, is a direct result of the fact that alloy and stainless steels require a smooth finish, free from all blemish. For semi-finished steels, a slightly firecracked roll could be used with no ill effects to the finished product, since a perfect surface finish is not necessary. Great wearing quality also will contribute to good surface finish. But it does more than that. It permits increased drafts and fewer passes in the attainment of the desired reduction. Greater efficiency and increased tonnage result.

A great many high-alloy and stainless steels require a "mirror finish," flawless and perfectly smooth, as the name implies. Since any roll surface mark or defect would necessarily be conveyed to and enlarged upon the rolled surface, a roll bearing a mirror finish has been developed. Because of the perfection of this finish, an important economy in time saving is also realized, since such rolls require far fewer dressings.

So from the three important improvements in roll manufacture the production field may derive three distinct benefits which will apply to their rolling of stainless or alloy steels. The modern roll will give them greater strength for heat and stress tension. It will give a greater resistance to firecracking and wear. It will give superior surface and a sizable reduction in roll dressing needed.

With quality definitely becoming the key word of the steel industry, there can be no real economy in using a roll of improper chemical composition or wrong heat treatment in the rolling of high alloy and stainless steels. The roll maker stands prepared to provide a superior tool to aid in the making of a superior product.



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ROLL on a roughing grinder being shaped to near final finishing size.

BELOW

LATEST type of 28-in. 16-ft. finishing grinder imparting a "mirror" finish to a roll to within ±0.001 in. of mean diameter.

Truck Builder Modernizes Finishing Operations

MOTOR truck manufacturers are following the recent trend towards more attractive design and better finish, as is shown by the later models of trucks, both in the heavy and commercial delivery types.

Streamlining has been extended to the truck building industry and considerably more sheet metal is used in the fabrication of fenders and other body parts than a few years ago. Fenders are larger than formerly and more trucks now have skirted fenders.

Dull gray for a long time was a standardized color for trucks. Now truck builders are getting away from the somber gray and are finishing trucks in bright colors. Operators of trucks for many purposes, particularly store delivery trucks, recognize that there is an advertising value in the use of trucks that are finished in attractive colors that are pleasing to the eye. Attention also has been given recently to the relation of color to safety. Trucks finished in bright colors can be more readily seen at night and, it is stated, are less frequently involved in collisions or other accidents than trucks painted a dull gray.

The White Motor Co., Cleveland, some time ago streamlined all its models of trucks and is supplying these in almost any color or combination of colors the buyer desires. The increased importance of the metal finishing department of a motor truck plant together with its desire to reduce finishing costs and provide better and more durable finishes led the White company to discard its previous finishing methods and to install new conveying and other equipment for coating truck parts. Formerly the parts were trucked to and from spray booths in which they were given a lacquer finish. This was a slow process in that it required a great deal of labor for handling.

With the new layout, parts after being cleaned are hung on an endless chain conveyor on which they move while being given three spray coatings, two bakings and sanding. When they leave the conveyor they are ready for final assembly to the chassis. Synthetic baking enamel has been substituted for lacquer as a coating material. The use of enamel instead of lacquer necessitated the installation of baking ovens. Installation of the modernized painting system has resulted in much speedier production, sharp savings in finishing costs and conservation of floor space.

The new painting system in the White plant is used for enameling fenders, cowls, running boards, shields and miscellaneous sheet metal parts. Another paint-

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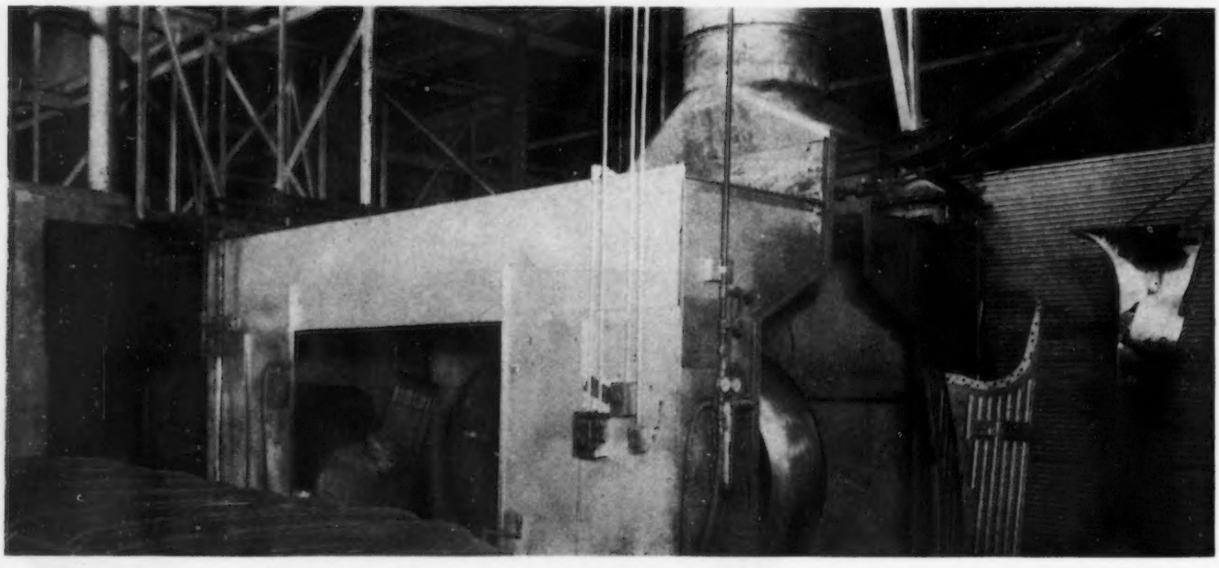

SPRAY booth in which the primer coat is applied to sheet metal truck parts while moving on an overhead conveyor. Back of the booth to the left in the picture is the baking oven.

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THE chassis, while moving on the assembly line, passes through a spray booth in which the frame and various assembled parts are painted.

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ing line generally similar, but somewhat smaller has been provided for finishing lamps, hoods, radiators and cabs.

The painting equipment for fenders is located along one side of the final chassis assembly room. Sheet metal parts, trucked from the material control room, are stacked in a storage space convenient to the conveyor line. The first operation of cleaning is performed at the side of the parts storage space. The work is first washed in hot alkali solution and then rinsed in hot water, after which it is hung on the plant conveyor. Here the pieces are wiped with a cloth dipped in a lacquer thinner and then tack ragged.

The conveyor is of the overhead endless chain type 750 ft. long. It follows a somewhat rectangular course around the painting department, but also makes several loops within the rectangular space, within which the spraying and baking equipment is located. The pieces are suspended from the conveyor chain on work holders of various shapes to fit the different pieces. These work holders are hung on 40-in. centers on hooks that form a part of the conveyor chain so that the holders are interchangeable.

Sheet metal parts first enter a

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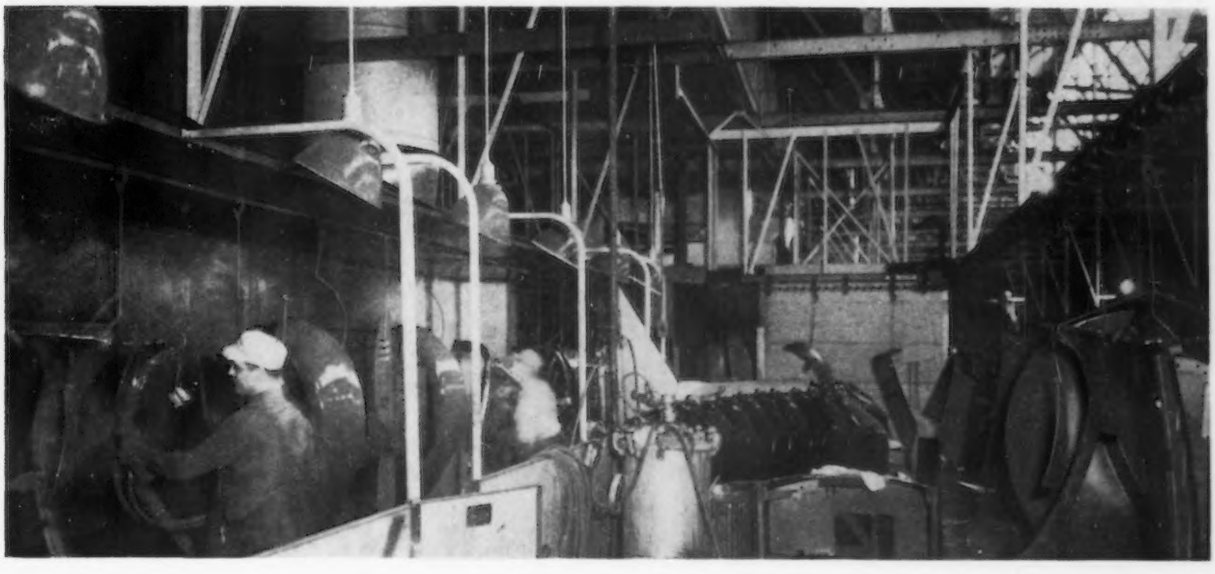
STAMPED parts for trucks are given two finish coats of synthetic baking enamel as they move along on a conveyor in this double spray booth. From the booth the pieces move on to the baking oven in the background.



single spray booth and are given a coat of primer surfacer, an oil oxide base primer being used. This has filling qualities that cause the coating to fill in slight scratches and weld marks. After priming, the work passes through a bake oven. On emerging from the oven and while moving along the line, the pieces are sandpapered to smooth the surfaces.

Beyond the point of sanding the conveyor loops back and passes through a double spray booth 36 ft. long, in which the parts are given two finish coats of synthetic baking enamel. The speed of the conveyor permits a 5-min. interval between the two sprayings in this booth.

From the enamel spraying booth the conveyor moves in a straight line back into the baking oven. Both the prime and finish coats are baked one hour at a temperature of 200 deg. F. The oven built in the White plant, is gas-fired by a Surface Combustion Corp. heater with a capacity of 1,000,000 B.t.u.'s.

The conveyor makes two loops through the prime coat side of the oven, bringing the work out at the end opposite to which it enters, but on the finish bake side it makes but one loop, coming out the side which it enters. The oven is 60 ft. long on the prime baking side and 90 ft. long on the finish coat baking side, but with the arrangement of the loops the length of travel through the two sides is identical so that the baking time is the same on both sides.

After emerging from the oven the conveyor with the finish baked parts loops around the end of the painting department and moves along a straight line to the starting point at the other end of the room. While moving along this section of the conveyor, the enameled parts are taken from the conveyor and subassemblies are made during their short travel to the chassis assembly line, which extends down the center of the room parallel with the overhead painting conveyor. Production in the painting department is synchronized with the chassis erection schedule. The conveyor serves as a bank for parts and thus reduces storage space that otherwise would be necessary.

The finish coat spray booth is well ventilated, fumes being carried away in two large stacks by the indirect exhaust method.

The spraying enamel is handled in 30 gal. tanks and the material, which is mixed in the plant, is checked every day to make sure that the established standard of viscosity is maintained. The tanks are filled twice a day at noon and at night so that they are always kept at least half filled with enamel.

The time cycle for handling the pieces on the paint line until they are removed with their finish coat of enamel, ready to be assembled to the chassis, is approximately 4 hr. The conveyor is operated at variable speeds, but usually moves at about 34 in. per minute. The production capacity of the painting system is parts for 75 trucks in an 8-hr. day. Only seven men are required for its operation, two for cleaning the pieces, one for spraying the prime coat, two for sanding and two for spraying the finish coating. Work is taken off the conveyor by the men employed on the chassis assembly line. Before the painting system was installed, it was necessary during normal production to have eight painters work at night to keep the assembly line supplied with parts.

After the chassis has undergone partial assembly with the motor and its auxiliary parts, axles and wheels mounted on the frame, it is spray painted in a booth while moving along the assembly line conveyor with two coats of air-drying synthetic enamel. The moving chassis is washed with naphtha on the conveyor and the motor is covered to protect it from the spray before the chassis enters the booth.

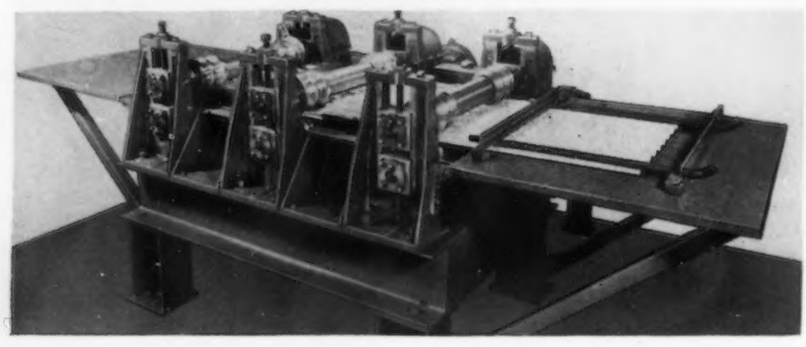
Offers New Leak Proof Roofing

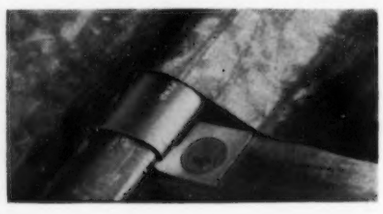
A NEW form of galvanized corrugated roofing for roofing and siding, which is claimed to be leak proof, has been brought out by the Kor-Lok Co., Union Trust Building, Cleveland. As in applying this roofing no nails are driven into the sheets, nail holes and the leaks caused by them are obviated. Leaks resulting from capillary attraction are also said to be entirely avoided or minimized, and siphonage is eliminated.

Designated as the Kor-Lok, this roofing is made by crimping in a forming machine the sides of the ordinary corrugated sheets to form an interlocking joint. The formed sheets have concentric curved surfaces and flanges along the sides so that there is close contact between two sheets when their flanged edges are joined and a seam is provided that is said to be practically water tight.

The sheets are fastened to the roof or side wall by small clips stamped from 18-gage steel corresponding in shape to the formed flanges. The clip fits snugly over the curvature along the side of the bottom sheet and when in place is nailed to the roof deck. The top sheet is then slid over it into position.

When applied to steel framing the clip is welded to a strap, one





KOR-LOK roofing formed on machine at left is applied as shown above.

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THE spindle of this turret lathe is mounted in tapered roller bearings and has a 16½-in. bore. The machine is for boring, turning, facing, and tapping operations on large steel forgings.

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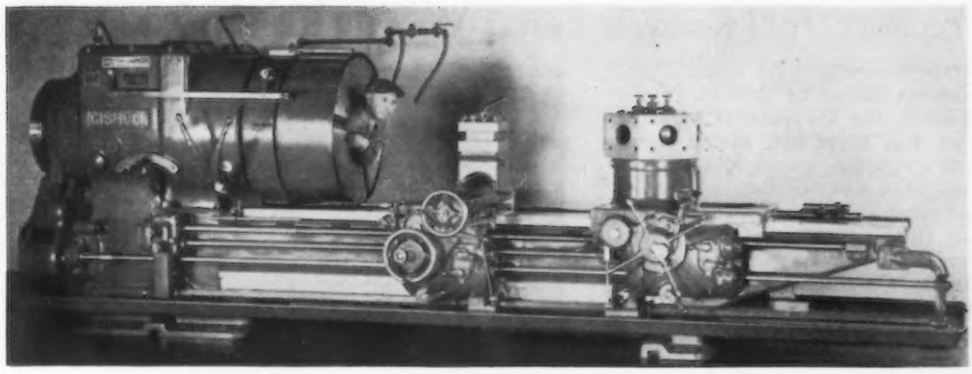


end of which is bent around a channel, or, instead of being welded, the strap may be put through a slot in the clip. A sheet metal clip easily made by the roofer may also be used as a fastening device if the sheets are fastened to wood.

The Kor-Lok Co. was organized by Harry R. Ansel, mechanical and structural engineer, who is its president. The sheets and fasteners are covered by patents and license arrangements will be made with distributers, to whom machines for forming will be furnished.

New Line of Fluid Motors

THE first unit of a new line of fluid motors of multiple-piston type has been introduced by the Sundstrand Machine Tool Co., Rockford, Ill. This unit, shown in the illustration, has a rating of 1 hp. at 900 r.p.m. It is small and compact and although designed

MULTIPLE-PISTON fluid motor designed for high-speed applications.

primarily for high-speed applications it is said to be suitable for speeds as low as 20 r.p.m. It can be reversed instantly while running at 3000 r.p.m.

The 1-hp. unit as well as the larger sizes will be built with a variable-speed adjustment or for a constant speed. The company is also bringing out a line of multiple-piston pumps for use with the new motors.

Heavy Turret Lathe for Machining Large Steel Forgings

FEATURES of the large, heavy-duty turret lathe here pictured, one of several similar machines built recently by the Gisholt Machine Co., Madison, Wis., include a spindle mounted in anti-friction tapered roller bearings and having a 16½-in. unobstructed bore.

The spindle is equipped with a Gisholt 34-in. three-jaw hydraulic chuck designed to suit a variety of work and operated by oil pressure from a separate hydraulic pumping unit. A standard lead-screw is used for feeding both the cross-slide carriage and the hexagon turret carriage. This lead-screw feed is of advantage in leading the large collapsing taps into the work at the proper rate. Because of the amount of stock to be removed in cutting the thread, two taps are used, one for roughing and the other for finishing.

A coolant device on the hexagon turret delivers cutting compound to the various tools on each of the six turret faces. A special force-feed oiling system is built into the machine to assure adequate lubrication of the anti-friction spindle and headstock bearings, as well as gears and other parts. This lubrication system is said to contribute greatly to maintenance of accurate spindle alinement by minimizing temperature changes in the spindle bearings.

Features in common with other turret lathes built by the company include hardened steel on the bed; one-piece bed and headstock, cast from a special semi-steel composition; and hardened steel gears with shafts mounted in anti-friction bearings. Power longitudinal rapid traverse is provided for both carriages, and also large dials to facilitate visual observation of length of cuts. There is an adjustable longitudinal trip and stop roll both for the hexagon turret and tool-post carriages. An automatic spindle brake stops the chuck quickly on completion of an operation.

Forum on Machine Electrification

FOUR formal sessions, two inspection trips, and an open forum on special applications are planned for the second machine tool electrification forum, to be held under the auspices of the Westinghouse Electric & Mfg. Co. at East Pittsburgh, April 19-22.

Motor standards, recent progress in motor design, dynamic braking of a.c. motors, and dynamic balance will be discussed on the afternoon of April 19. A control session the next morning will be devoted to control standards, present and contemplated, new applications, and electronic control.

The third session, on the morning of April 21, will include machine tool wiring, electrical equipment for roll grinders, design and application of motor-operated chucks, automatic machine, electric drives, and electric control of hydraulic motions. Electric welding machine parts, and electrical standards for machine tools in the steel and automobile industries will also be discussed.

Robbins & Myers, Inc., Springfield, Ohio, licensee of the Moineau pump patents in the United States and Canada, has organized a pump division. E. B. George will head the new department.

Pneumatic Tool Removes Excess Weld Metal

FOR removing weld splatter and excess metal in production arc welding, the Cleveland Pneumatic Tool Co., Cleveland, is offering a new portable pneumatic scaling tool. The tool can also be used for removing the flash from welds and for cleaning the surface of successive weld deposits where several layers of weld metal are applied. It is also adapted for cleaning rust and old paint from metal surfaces.

A special feature of this Cleco B-1 pneumatic scaling tool is a graduated inlet valve. Located at the rear end of the tool, the natural motion of the operator's hand automatically admits the right amount of compressed air to most effectively do the work. Slight pressure admits sufficient air if the work is light, but when the cut is heavier there is naturally more hand pressure and consequently more power to do the work.

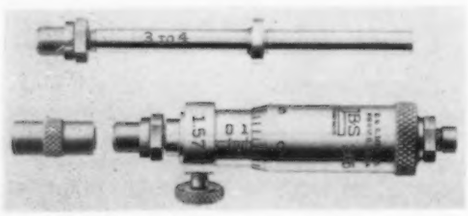
The chisel retainer is designed for convenience as well as for effectiveness. Holding the chisel securely when the tool is in operation, the retainer releases by the mere flick of the operator's thumb. The nose or chuck of the tool is broached square, as this shape affords the maximum of security against the turning of the chisel in the chuck as well as long wear life. Chisel blanks, made from ½-in. sq. tool steel are supplied by the company.

PNEUMATIC scaling tool in operation cleaning up welds in production work.

Inside Micrometers Easily Adjusted

TWO new inside micrometers featuring an adjustable point and locknut on the thimble are being announced by the Brown & Sharpe Mfg. Co., Providence, R. I.

Wear on the measuring point of the thimble end is naturally many times that on the point of the several individual rods, and should wear occur it is only necessary to adjust this one measuring point to the fixed distance stamped on the tool. It is not necessary to adjust all the individual rods. These new micrometers are designated as the No. 266 and No. 267; the first measures from 2 to 8 in. and the second from 2 to 12 in.



AT RIGHT

GEAR wires for measuring pitch diameter of involute gears.

o o o

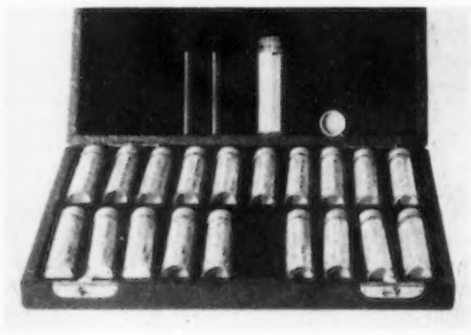
AT LEFT

THE adjusting point and lock nut on the thimble is a convenient feature.

Gear Measuring Wires

GEAR wires suitable for measuring the pitch diameter of either 14½ or 20-deg. involute gears of any number of teeth from 9 to 200 have been placed on the market by the Van Keuren Co., 12 Copeland Street, Watertown, Mass.

This system of gear wires is based on formulæ given in Prof. Earle Buckingham's book on "Spur Gears" and is said to greatly simplify calculations. The system involves the use of a series of wires which are inversely proportional to the diametral pitch, tooth factors for each different numbers of teeth from 9 to 200, and values of Cos 90/N deg. for use in measuring gears with odd numbers of teeth. Complete formulae and tables showing how to make pitch diameter measurements are furnished with the new sets of wires.



High-Speed, 9 In. Manufacturing Lathe

AN improved high-speed headstock features a 9-in. manufacturing lathe offered by Porter-Cable Machine Co., Syracuse, N. Y. Particular adaptability is claimed by the makers in connection with precision turning, facing and boring on valves, pistons, pulleys, commutators and like parts. Multiple V-belts drive the spindle direct from the motor which is adjustable, plate-mounted at the rear of the bed and suspended by vulcanized rubber mounting. The hollow spindle runs in preloaded precision bearings, force-feed lubricated. Mounting permits the rear bearing to float in compensating for varying lengths of bearing centers, due to temperature changes.

Speeds up to 3600 r.p.m. are available through motor-pulley changes. Direct operation from motor eliminates clutch necessity and provides starting, stopping and reversing by switch. Constant feed ratio per revolution of spindle is attained by driving the feed pick-off gears by V-belt from the spindle. Pick-off gears provide feeds from 0.0005 to 0.010 in. A wide range of multiple tooling on both front carriage and facing attachment is available.

Gear Tooth Chamfering Machine Designed for High Production

PRODUCTION rates as high as to 600 teeth per min. in chamfering and burring operations are obtainable with a new high-speed gear chamfering machine being marketed by the Cimatool Co., Dayton, Ohio. Three different models, designated as the Nos. 4-A, 4-B and 4-C, respectively, are built; each of them can be arranged for either air, hydraulic or manual operation.

These machines utilize hollow mill cutters, and the cutter-heads are provided with rapid traverse to and from the cutting position. During the cutting period the spindles rotate while locating against an adjustable back-stop.

The smallest machine, the 4-A, comprises a single work-head and a single cutter spindle mounted on one base. The model 4-B has a single work-head with two cutter spindles, both designed to machine a single part simultaneously. The 4-C comprises two 4-A machines on a single base, or two complete single-spindle machines on one base.

On the 4-A machine the teeth on one face of the gear can be chamfered. On the 4-B inner and outer faces of a ring or bevel gear may be chamfered simultaneously, or the two cutter spindles may machine similar gear teeth on the same face of the gear but on opposite sides of the gear, so that complete chamfering of one face of the gear is accomplished in ½ revolution of the part. The 4-C model, combining two of the single-spindle machines, enables the operator to load one part on one work-head while the other half of the machine is operating on another part. Two different gears may be handled by the same operator.

The work-head of the machine not only indexes the part, but also feeds it to the cutter. Indexing is accomplished by a mechanism that provides the smooth action of a worm and worm-wheel with a constant mesh index. Synchronized with the indexing action is a cam mechanism which moves the work to and from the cutter. The shape of this cam can be varied to provide the best cutting feeds.

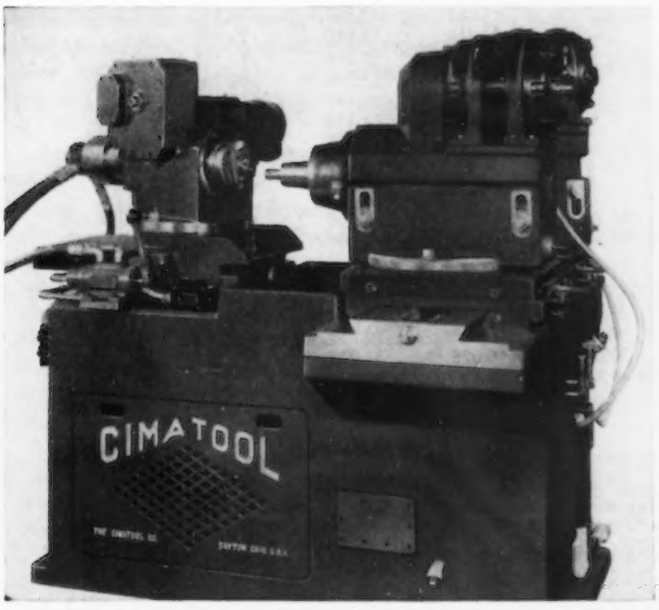
The work-spindle is triangular and is made of a cast heat-treated alloy to provide maximum wear resistance. The part in which this spindle reciprocates has an adjustable gib for wear take-up, and to obviate cocking action a pair of springs is mounted on each side, the latter not only providing balancing pressure on the reciprocating work spindle but a cushioning effect as well. Speed changes are effected by changing pulleys on the work-head drive.

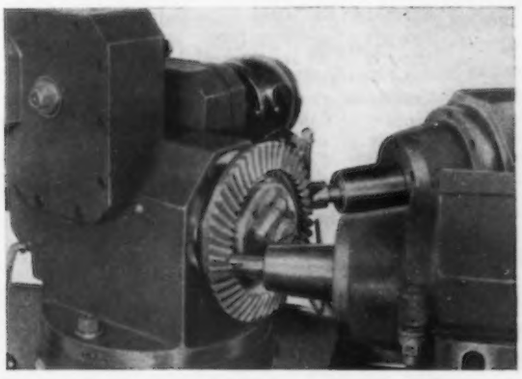
Precision tapered roller bearings are standard equipment on both the work-head and the cutter-head. The cutter-head is equipped with a heavy, balanced flywheel to assure additional smoothness of cut. The machines are equipped with a self-contained lubrication system and a built-in coolant system.

The work cycle may be completely hand-operated or entirely automatic, the latter arrangement at additional cost. The automatic cycle, started by pressing a push button, includes: clamping of the work, quick traverse of cutter-spindle into cutting position, indexing of the part and other movements to the automatic machine shut-off and automatic releasing of the work. Safety features to protect the operator and the machine are amply provided.

Air-Drying Primer For Spot Welding

AN air-drying spot welding black primer for the automotive and other industries using welded construction has been announced by the Sherwin-Williams Co., Cleveland. The material is said to prevent formation of rust between the laps and to permit instantaneous spot welding with low voltage and low pressure. It eliminates burning away of the paint surrounding the spot weld. The primer dries to the touch in 10 to 15 min. and may be handled for spot welding in 25 to 30 min. Xylol or toluol can be sprayed on sheet metal parts after application of the black primer, which is designated as the X9185.





WITH the 4-B gear chamfering machine the inner and outer faces of a bevel gear may be chamfered simultaneously or the two cutter-spindles may machine similar teeth on the same face of the gear, but on opposite sides. A close-up of the 4-B machine in operation is above.

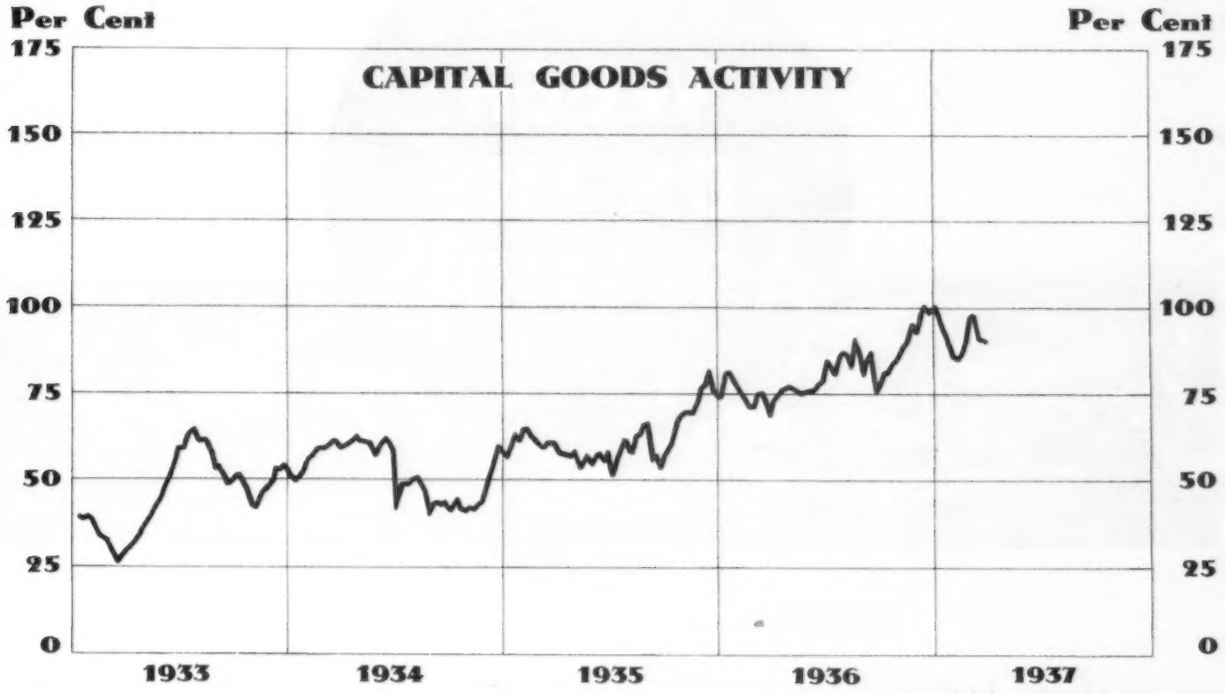
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	February, 1937	January, 1937	February, 1936	Two Months, 1936	Two Months, 1937
Raw Materials:					
Lake ore consumption (gross tons)[a]	4,443,306	4,694,312	2,632,306	5,583,874	9,137,618
Coke production (net tons)[b]	4,283,681	4,629,532	3,293,542	6,743,884	8,913,213
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	2,999,218	3,211,500	1,823,706	3,849,591	6,210,718
Pig iron output—daily (gross tons)[c]	107,115	103,597	62,886	64,160	105,266
Castings:					
Malleable castings—production (net tons)[d]	.....	53,638	40,611	88,809	.....
Malleable castings—orders (net tons)[d]	.....	54,070	38,278	82,130	.....
Steel castings—production (net tons)[d]	.....	89,649	47,954	92,252	.....
Steel castings—orders (net tons)[d]	.....	114,939	51,701	110,720	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	4,424,659	4,736,697	2,964,418	6,010,364	9,161,356
Steel ingot production—weekly (gross tons)[e]	1,106,165	1,069,232	716,043	701,326	1,086,756
Steel ingot product—per cent of capacity[e]	84.46	81.64	54.67	53.55	82.97
Finished Steel:					
Trackwork shipments (net tons)[e]	8,153	7,246	4,116	7,482	15,399
Sheet steel sales (net tons)[f]	.....	.....	138,244	313,049	.....
Sheet steel production (net tons)[f]	.....	.....	191,359	414,359	.....
Fabricated shape orders (net tons)[g]	88,946	130,651	140,943	261,307	219,597
Fabricated shape shipments (net tons)[g]	91,848	92,020	78,203	158,198	183,868
Fabricated plate orders (net tons)[d]	.....	40,424	27,863	66,572	.....
U. S. Steel Corp. shipments (tons)[h]	1,133,724	1,149,918	676,315	1,397,729	2,283,642
Ohio River steel shipments (net tons)[i]	88,170	96,400	13,782	79,542	184,570
Fabricated Products:					
Automobile production, U. S. and Canada[k]	.....	399,426	300,874	678,180	.....
Construction contracts, 37 Eastern States[l]	$188,590,800	$242,844,000	$140,419,100	$355,211,900	$431,434,800
Steel barrel shipments (number)[d]	.....	919,290	517,424	1,060,021	.....
Steel furniture shipments (dollars)[d]	.....	$2,120,744	$1,484,145	$3,070,591	.....
Steel boiler orders (sq. ft.)[d]	.....	651,063	810,387	1,433,751	.....
Locomotive orders (number)[m]	33	46	46	60	79
Freight car orders (number)[m]	10,532	10,881	7,236	8,286	21,413
Machine tool index[n]	165.2	200.3	112.1	†107.1	†207.7
Foundry equipment index[o]	249.5	190.9	110.4	†118.5	†241.2
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	43,063	43,358	93,847	.....
Imports of pig iron (gross tons)[p]	.....	12,434	14,660	29,693	.....
Imports of all rolled steel (gross tons)[p]	.....	24,409	18,208	41,166	.....
Total iron and steel exports (gross tons)[p]	.....	201,511	213,736	455,300	.....
Exports of all rolled steel (gross tons)[p]	.....	110,139	65,947	145,047	.....
Exports of finished steel (gross tons)[p]	.....	103,495	62,322	136,576	.....
Exports of scrap (gross tons)[p]	.....	68,884	142,165	296,071	.....
British Production:					
British pig iron production (gross tons)[r]	603,700	650,700	584,700	1,180,200	1,254,400
British steel ingot production (gross tons)[r]	995,900	998,900	938,500	1,851,000	1,994,800
Non-Ferrous Metals:					
Lead production (net tons)[s]	37,451	43,636	34,127	70,423	81,087
Lead shipments (net tons)[s]	50,375	45,718	33,096	67,676	96,093
Zinc production (net tons)[t]	38,010	40,025	36,228	78,145	78,035
Zinc shipments (net tons)[t]	47,591	50,638	39,918	86,386	98,229
Deliveries of tin (gross tons)[v]	7,675	7,615	5,600	12,235	15,290

† Three months' average.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp. [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.



THE IRON AGE Weekly Index Numbers of Capital Goods Activity

(1925-27 Average = 100)

Last week	90.3	Same week 1933	28.6
Preceding week	*90.8	Same week 1932	37.4
Same week last month	97.0	Same week 1931	72.5
Same week 1936	68.3	Same week 1930	101.4
Same week 1935	60.2	Same week 1929	126.9
Same week 1934	59.6		

* Revised.

THE past week was marked by a further slight recession in business conditions affecting the capital goods industries, although in most of the heavy industries surveyed actual rates of production or other operation increased slightly. Such losses as occurred therefore were mainly due to the fact that the general upswing at this time is not keeping pace with the usual rate of seasonal improvement, because first-quarter business has been sustained all along.

Seasonal expansion and contraction is a common occurrence, but expansion cannot proceed normally unless there has been a preceding seasonal slump of normal proportions. The fact that during the pre-spring period just ended business did not show the usual recession is responsible at this time for some falling off in THE IRON AGE'S seasonally adjusted index of durable goods operations.

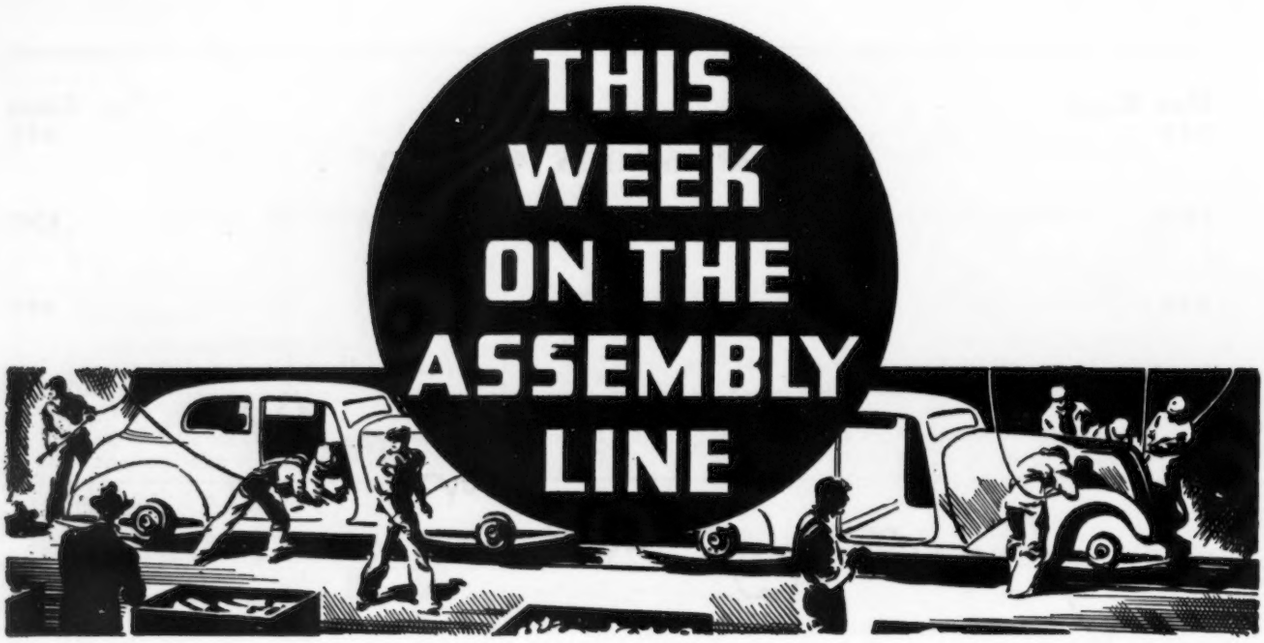
The way, however, to determine current activity is by comparison with previous years. While, in the week just ended, the index declined from the week before, its showing of 90.3 per cent of the 1925-27 average compares with but 68.3 for the corresponding week last year and with only 28.6 for the corresponding week in 1933.

Since the period from 1925 through 1927 may be taken as a good indicator of normal business volume, it is evident that currently conditions are within less than 10 per cent of normal, and this active situation has persisted, moreover, as a rough average since the year opened.

The operations used in figuring the index for the past week are given below in terms of actual volume.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	90	+1
Automobile production (number of cars and trucks)	101,115	+2,137
Railroad loadings of forest products (number of cars)	37,387	—1,434
Pittsburgh industrial production and shipments (index number)	113.0	+1.3
Construction contracts awarded (total value)	$49,006,000	+$14,437,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.



. . . American Legion takes a hand in combating communistic elements in the automobile labor movement.

o o o

. . . UAW serves notice on tool and die shops of unionization drive, demanding $1.60 an hr. for die leaders, while MESA quietly makes contracts with numerous jobbing shops.

o o o

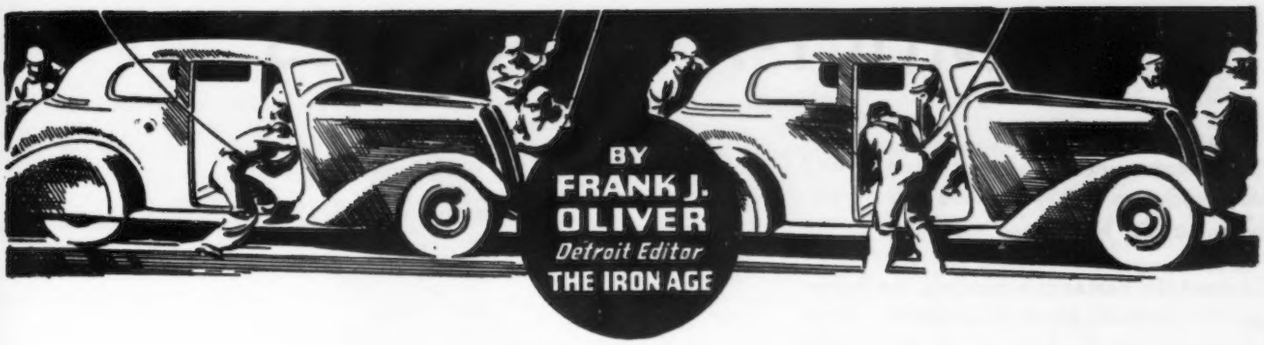
. . . Chevrolet to produce 1200 engines and axles a day at Buffalo, the first time such production goes out of Michigan.

o o o

. . . March production should be close to 500,000 units, despite Chrysler units being out of production since March 8.

DETROIT, March 29.—The past week has seen a political about-face in both the State of Michigan and the nation as regards the official attitude toward sit-down strike. Certainly since Governor Murphy began taking a much stronger law-and-order stand than he has heretofore assumed, the series of sporadic sit-down strikes has diminished tremendously and by last week-end, only about a scant half-dozen plants were still struck, whereas in recent weeks the number had been as high as 30. According to the political experts, Governor Murphy went off on this new tack largely because the State committee brought pressure to bear, indicating that severe losses would be suffered in the April 5 State election unless a concerted effort was made to uphold the dignity of the courts and to end the series of illegal sit-down strikes. How labor has accepted this change in front can be gaged by the letter that Maurice Sugar, attorney for the UAW, addressed to the Governor last week. He bitterly accused Mr. Murphy of selling out to the Liberty Leaguers. Whether he had or not, he succeeded in convincing John Lewis that the evacuation of the Chrysler plants was essential to any further steps in negotiations between the corporation and the CIO.

After sitting in the plants since March 8, Chrysler strikers were very reluctant to leave. Homer Martin and his cohorts talked themselves hoarse last Thursday trying to persuade the workers to leave the plants and it was reliably reported that the men left the plants only because they were ordered out by John Lewis. In a way, this was poetic justice, since the men had been ordered to strike by their national officers without being given an opportunity to take a vote. In fact, it was recently brought out that at the Hudson Motor Co. plant the workers were given no warning as to the strike and realized there was one only when the shop stewards failed to clarify an order as to why they should not continue work after the noon recess. These actions bear out the headlines that appeared this week in Father Coughlin's weekly review *Social Justice*, which read "Labor Dictatorship Rides Strike Wave." Father Coughlin maintains that the union members themselves have no vote and must take their orders from above. In a way, this dictatorship has some advantages since national officers have been able to squelch 20 or more unauthorized sit-down strikes in General Motors



plants that have occurred since the historic agreement was signed on Feb. 11. In nearly every instance, the men were ordered back to work in no uncertain terms and apparently obeyed without further protest.

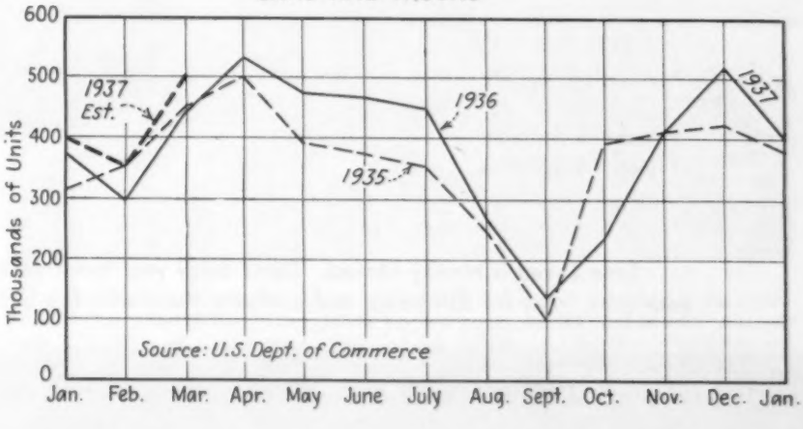
Public Opinion Against Sit-Down

The fact that only 15,000 to 20,000 persons turned up at the UAW mass meeting held in Cadillac Square, Detroit, when it was advertised by the UAW that at least 250,000 would show up, rather definitely indicates a lack of enthusiasm on the part of the members. Public opinion has taken a definite swing away from the sit-down technique partly because of the communistic element that has crept into the situation. While Homer Martin has denied on several occasions that he will have any truck with the Communist Party, several high officers of the organization, including Wyndham Mortimer, first vice-president, are known to have been associated with the party at one time or another. In the meantime, the American Legion has held a number of meetings locally taking a very strong stand against the communistic element in the strike situation. Oddly enough, a number of posts formed at some of the large automobile plants have been most active in this regard. Several informed people in labor circles believe that the battle for the mastery of the UAW will seriously cripple its present drive, if not render it entirely ineffective.

Another impending internal fight that is bound to have an influence on the general situation is the attempt of the UAW to organize the independent tool and die shops in this area. Last week the union sent out a letter to 400 plants, including not only the jobbing shops, but also the metal-working plants that have tool or die departments, informing the managements of their intention to organize the group and suggesting the possibility of a peaceful agreement being worked out on an industry-wide basis before any strikes occur. It was proposed that a minimum rate of $1.60 an hr. for die leaders and $1.35 for other skilled workers be established. This particular field has also been claimed by the Mechanics' Educational Society of America and during the past two weeks Matthew Smith, general secretary, has been able to obtain 15 or more contracts with local jobbing shops without any fanfare of publicity. In fact, part of the agreement in every case was that there should be no newspaper publicity on the terms of the contract. There has also been newly formed a Society of Tool and Die Craftsmen, which is cutting in on this field.

At the present writing, the average wage of skilled craftsmen in the tool and die shops is $1.08 an hr., making the proposed rate of $1.60 fantastic in comparison. Smith, much more of a realist than any of the UAW crowd, believes that rates still can be advanced 10c. an hr. more without much work going out of town. The differential in Detroit over other metal-working centers such as Chicago, Cleveland or Buffalo, has been justified on the basis that Detroit workers make much more effective use of their time. It is true, however, that several die contracts have already been placed by automobile manu-

TOTAL AUTOMOBILE PRODUCTION – U.S. AND CANADA
CARS AND TRUCKS



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- Small work requiring higher speeds and higher feeds can usually be done more Profitably on smaller high-speed machines.

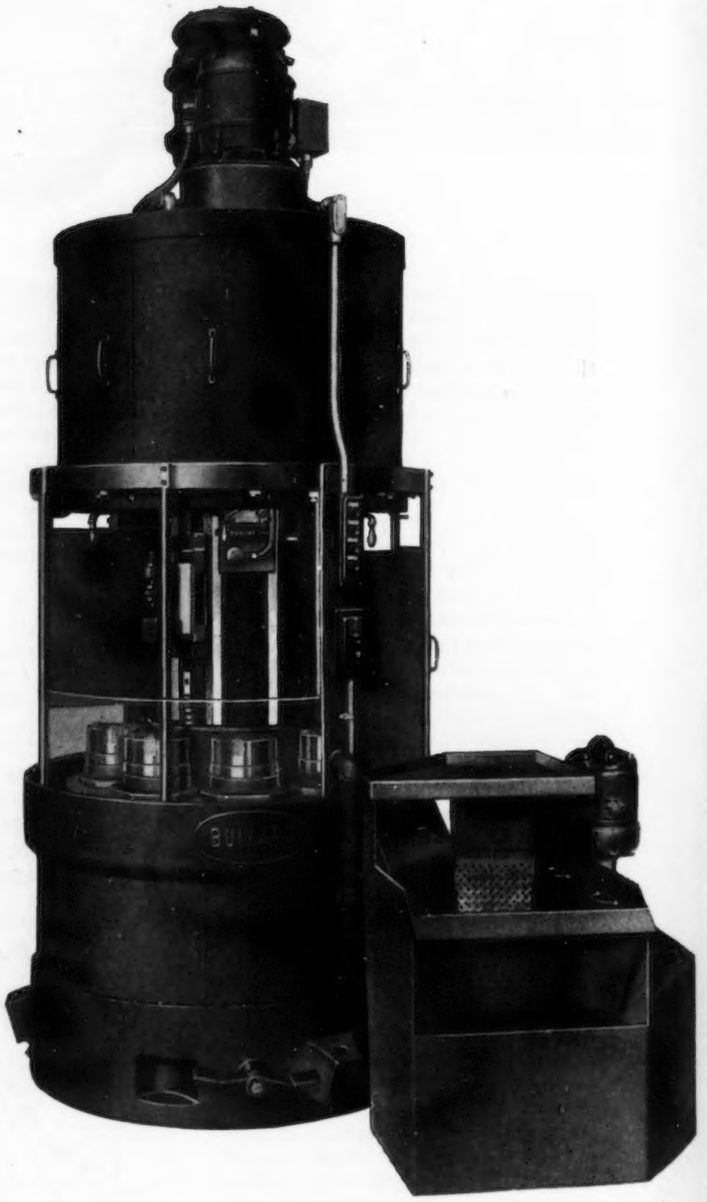
- To meet the demands in this field, the Bullard Type "J" Mult-Au-Matic is available. It includes many of the features of the heavier Type "D" series, but has in addition many features found necessary for the Efficient operation of higher speed units.

- Exceptional feed and speed ranges, individually independent and variable at each station, broaden the scope and possibilities of time reduction on many operations. Mechanical power operated chucking facilitates the loading and unloading of work in the minimum periods of time allowed by the fast cycle time.

- Electrical push button stations provide for ease and flexibility of control and manual operation.

- Double Index is obtainable to meet the requirements of 1st and 2nd chucking on the same machine.

- Fast Indexing and Rapid power traverse of tools to and from point of cutting minimize lost time between cuts.



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MACHINE SIZES

7 inch—8 Spindles
11 inch—8 Spindles

Time Saved is Money Earned. Don't delay your investigation of these machines as applied to your jobs. Ask for Estimates, and compare these with the best previous methods used.

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facturers in such places as Philadelphia and Salem, Ohio. The die program has yet to start in Detroit on any scale outside the big corporation shops like Fisher Body's plant No. 23, so that the die makers may well cut off their noses to spite their faces if their demands should reach fantastic proportions.

New Chevrolet Plant at Buffalo

General Motors' recent labor difficulties have given the corporation no cause to change from its policy of decentralization, which it has been carrying on in recent years. Last week plans were announced for the construction of a new motor and axle plant for the Chevrolet Division at Buffalo. The plant, which will comprise nearly 1,000,000 sq. ft. of floor space, will have a capacity of approximately 1200 motors and axles a day and will represent an investment of nearly $11,000,000 in plant and machinery. Together with the assembly plant there, there will be a total of about 6000 workers on the payroll by next January, when the plant gets into operation. The motor line will serve Buffalo, Baltimore and Tarrytown, N. Y., assembly lines. This is the first time that motor production has gone outside of the main plant in Flint, where approximately 6000 motors a day are now being produced. Buffalo was selected as the site because of the availability of Lake transportation and the labor market there. Incidentally, the choice of Grand Rapids for a stamping plant has proved to be a very wise one from the point of view of the labor market.

It also appears to be fairly certain that General Motors is to put up a truck Diesel engine plant in the Redford district of Detroit. Originally it was planned to make these engines, together with parts for the fuel injection system for the Winton Engine Co. of Cleveland, another General Motors subsidiary, in the Cadillac plant, but it is understood that Cadillac executives did not welcome this outside production even though there was plenty of floor space made available by concentrating four floors of machinery on a single floor through rearrangement in layout.

Output Tops 100,000 Units

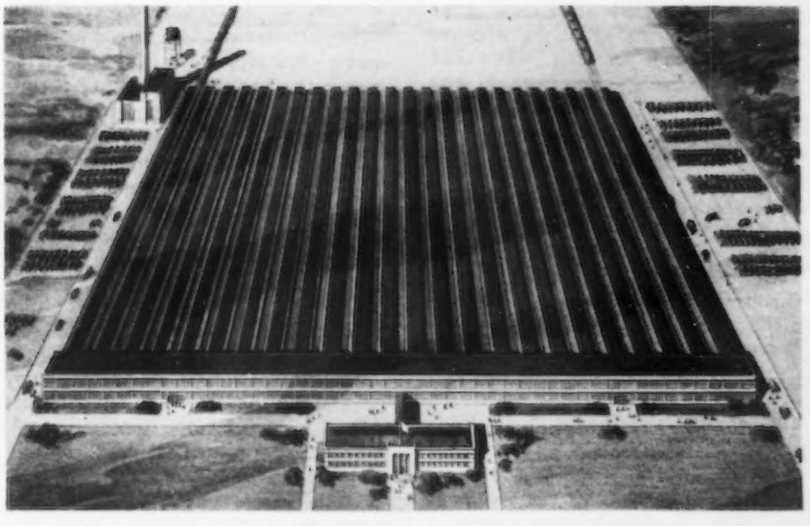
Automobile production for the week ended March 27 bounded back across the 100,000 mark despite the fact that Chrysler's production was zero. According to Ward's Automotive Reports, production of passenger cars and trucks in the United States and Canada was 101,115 units compared with 98,878 the previous week and 101,965 in the corresponding period last year. General Motors divisions gained to 52,650 and Ford moved up to 32,450 from 31,825. Production for the month of March is expected to be just under 500,000 cars and trucks compared with 438,992 in March, 1936. Anticipated volume was reduced by about 77,000 cars for lack of Chrysler and Hudson production. Production for the quarter, despite the General Motors tie-up in January and the more recent difficulties mentioned, will make this the best first quarter since 1929, totaling approximately 1,250,000 passenger cars and trucks.

Sales of passenger cars continue at a brisk rate and those companies in production are reporting large percentage gains over similar periods last year. Studebaker reports an increase of 17 per cent for the first 20 days of March and an increase of 25 per cent for the 1937 run to date. Buick retail deliveries are running 40 per cent over the volume at this time last year and Buick entered April with 35,500 unfilled wholesale orders. Nash shipments for the first three months of the 1937 fiscal year were 170 per cent greater than the corresponding period of 1936. Lincoln-Zephyr produced by March 25 as many cars as the total production for the 1936 series. Pontiac's forecast schedules through June call for 66 per cent more cars than were produced during the same period last year. Thus there is no evidence of a declining market. The first news of a price increase in cars has yet to leak out, although some local dealers have been anticipating such changes for weeks. It seems likely, however, that the fear of restriction of markets will postpone this inevitable event as long as possible.

Profits May Be Reduced

What with increased wages and salaries as well as rising materials cost, the industry is going to be hard pressed to make as good profits this year as it did last. Several of the independents have already reported substantial gains in 1936 over 1935. Hudson earned $3,305,616 as compared with $584,749 in 1935. Sales rose 21.9 per cent to 123,266 cars, the largest number in the past seven years. Studebaker showed a profit of $2,187,782 after sustaining a loss in the preceding year. Packard almost doubled its income, reporting a net profit of $7,053,220 for 1936, compared with $3,315,622 in 1935. The company produced 54.4 per cent more cars in 1936 than in 1935, and during the last five months, when the Six was in production, made 75 per cent more cars than in the corresponding period in 1935. Retail sales totaled 83,226 or 82.8 per cent higher. Present schedules call for more than 600 cars a day, and yearly output is estimated at 150,000 cars. Ford of Canada increased its profits in about the same ratio, rising from $1,939,204 to $3,358,469 in 1936, despite a reduced volume from 79,844 to 59,971 units.

Steel buyers in the industry are finding for the first time in years that this is a seller's market and are obliged to accept allotment of tonnages on the basis of last year's consumption. Every effort has been made to keep General Motors supplied with material, after their being off the rolling schedules for many weeks, but the backlog of steel in the plants is still very low.



FOR the first time Chevrolet goes outside the Michigan area to manufacture engines and axles. This Buffalo plant, ready for occupancy by the first of next year, will have a capacity of 1200 motors a day, adding 20 per cent to Flint production and making a potential output 7200 units daily. This plant will serve Buffalo, Baltimore and Tarrytown, N. Y., assembly plants.

WASHINGTON. . . . . .

. . . Cast iron pipe makers sued under Robinson-Patman Act by Federal Trade Commission in effort to abolish Birmingham price basing.

o o o

. . . Commission also sues brokerage buying concern for alleged violation of same law in accepting fees "for which no service is rendered."

o o o

. . . Federal Administration is faced with task of paring down expenditures or increasing taxes in order to balance the budget.

o o o

By L. W. MOFFETT

Resident Washington Editor, The Iron Age

o o o

WASHINGTON, March 30.—Predictions made by THE IRON AGE that the Federal Trade Commission would resort to the Robinson-Patman Anti-Price Discrimination Act to strike at the basing point system were fulfilled yesterday with the announcement by the commission of a complaint against the Cast Iron Soil Pipe Association and 35 makers, who are said to produce and sell 90 per cent of the cast iron soil pipe in the United States. The complaint carries two counts, one under the Federal Trade Commission Act and the other under the Robinson-Patman Act. Both center around the use of the Birmingham-plus pricing system. Violation of the Federal Trade Commission Act is alleged through combination and agreement to lessen and restrain competition. Violation of the Robinson-Patman Act is charged through so-called discrimination in price among buyers of cast iron soil pipe.

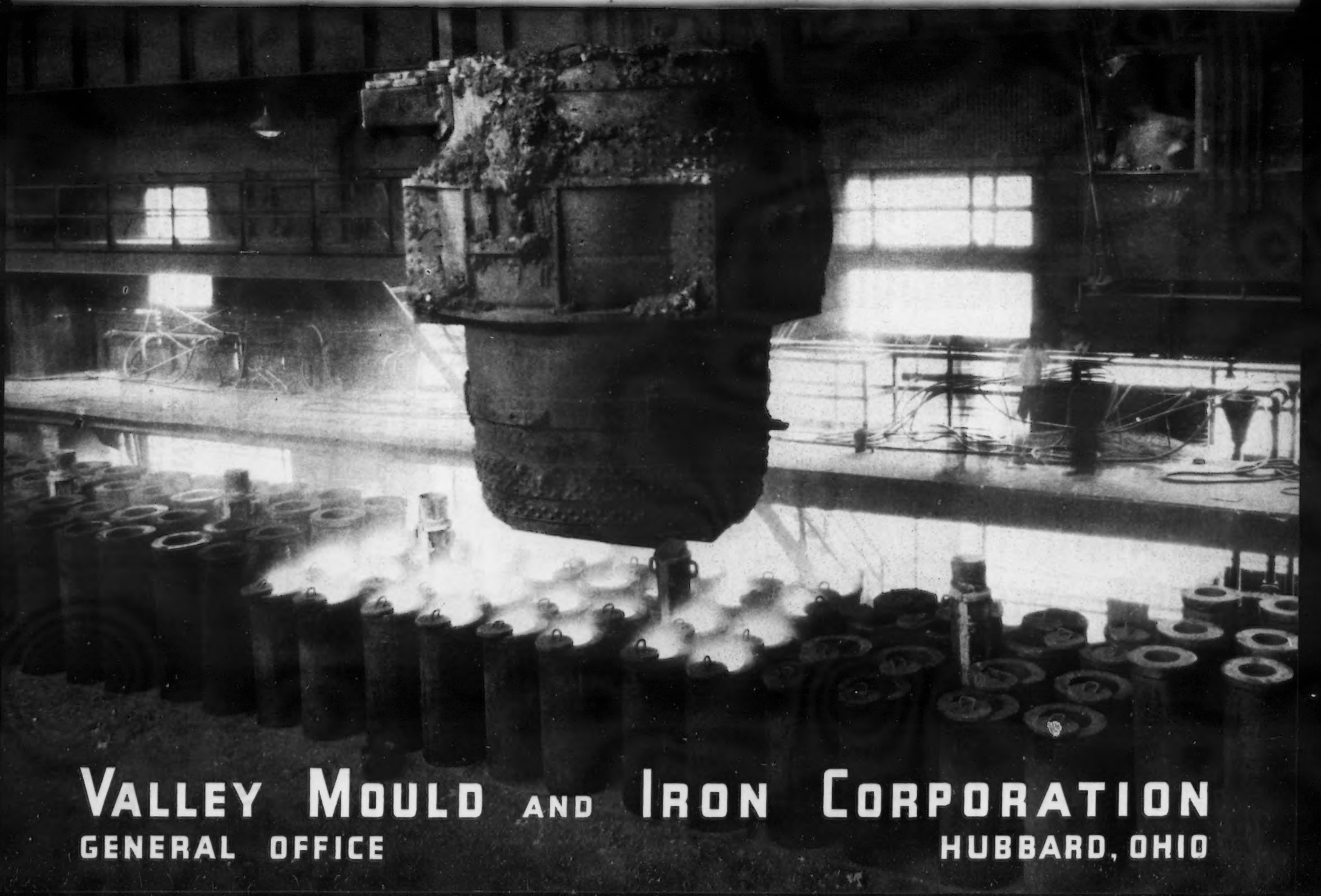
The charge under the Federal Trade Commission Act is the same as that instituted by the commission in its original basing point system case when through the United States Steel Corp. it attacked the Pittsburgh-plus system as it related to the iron and steel industry. The complaint brought against cast iron soil pipe makers is the first of the kind brought under the Robinson-Patman Act.

Wants F.o.b. Plant Pricing

Manifestly it is the purpose of the commission not only to abolish the Birmingham-plus basing point system as used by cast iron soil pipe producers, but to apply the same principle to all industries using the basing point system, and they cover a wide range of basic products. In the place of the basing point system the commission wants these industries to adopt an f.o.b. plant system of pricing. It has fought for abolition of the basing point system in one form or another ever since its initial proceeding against the United States Steel Corp. about 14 years ago. Legislatively an expression of its effort in this direction is sought through a bill now before the Senate Committee on Interstate Commerce, reintroduced by its chairman, Senator Wheeler of Montana. After extensive hearings on this bill at the previous session, when a large array of steel executives appeared before the committee in opposition to it, the bill was not reported out. Senator Wheeler has said he will urge passage of the bill at the present session but that no further hearings will be held on it, though it has been indicated that if supported by adequate request further hearings might be held.

In its count against the cast iron soil pipe producers under the Robinson-Patman Act, distinction is made between delivered prices and actual prices. It is stated that the actual price is derived by deducting from the delivered price the cost of transportation, "such transportation cost varying with the respective locations," with relation to Birmingham, the basing point of the buyers. Under this count it is charged that the cast iron soil pipe makers' alleged combination has resulted in discriminations by producers not located at Birmingham, and that by these so-called discriminations competition among the producers, wherever located, is substantially lessened in violation of the Robinson-Patman Act, which was passed at the previous session of Congress as an amendment to the Clayton Anti-Trust Law.

Included in the complaint are tabulations of sales at producing points other than Birmingham, which give the Birmingham base prices, freight from Birmingham, delivered prices, deduction of freight to destination and finally


VALLEY MOULD AND IRON CORPORATION
GENERAL OFFICE
HUBBARD, OHIO

the "actual price received." These tabulations, the complaint says, show that each producer outside the Birmingham district, by the use of the Birmingham-plus system, charges buyers located at his point of production the highest actual price which he receives from any of his customers.

Competition Lessened, Is Charge

It is further alleged that the effect of these alleged discriminations is to eliminate price competition among cast iron soil pipe producers and non-members of the Cast Iron Soil Pipe Association "to the precise extent that the system is followed." The complaint says that each producer reciprocally waives the advantages "which he has in certain consuming areas in order that there may not anywhere be competition in price between producers who, except for such reciprocal waiver, would be in normal active competition in price."

The basing point system, as used by the cast iron soil pipe makers, differs from that applying to the steel and other industries in that the former quote prices on a single base while the latter have multiple basing points. This, however, does not affect the underlying principle back of the commission's complaint, which is to establish an f.o.b. plant system of quoting.

The commission says that for more than 10 years cast iron soil pipe makers have used the Birmingham-plus system, under which, to the extent that the system is followed, all cast iron soil pipe, wherever produced, is sold at delivered prices, which are equivalent to the base price fixed at Birmingham, plus the freight rate from Birmingham to the buyer's freight station, wherever located." From the delivered prices, the complaint states, there are deducted trade discounts which vary for the buyers of different classes, but are uniform to buyers of the same class. Each respondent company, it is charged, makes a delivered price, identical with that made by every other producer adhering to the Birmingham-plus system, to any given customer wherever located," such uniform pricing being carried on by each respondent company with the knowledge that all other producers following the system will quote and charge identical delivered prices.

Points Set Forth by Commission

In addition to charging lessening price competition within the industry, the commission alleges that use of the Birmingham-plus system has the following effects upon the buying public:

(1) They are compelled to pay artificially enhanced prices; (2) they pay delivered prices precisely the same as though all cast iron soil pipe produced in the United States were produced at and shipped from Birmingham; (3) they pay the same delivered prices precisely as though there were no natural advantages for the production of the pipe elsewhere than at Birmingham and no means for transporting it to given destinations more cheaply than from Birmingham; (4) the prices charged by the respondent producers are made without regard to varying local conditions of demand and supply and are made through a concert of action which is formulated and expressed in terms of the Birmingham-plus system, which applies throughout most, if not all, of the country, and (5) inasmuch as producers do not avail themselves of their competitive advantages, such as nearness to raw materials, means of transportation, proximity to large consuming populations, and financial strength and able management, the buying public loses the advantages of efficiency and

economy and transportation which would result from price competition.

At some length the complaint details and explains a standardized form of contract and a uniform system of classification of buyers and of preferential discounts to certain classes of buyers. It is alleged that this form provides uniform terms of sales which the respondents have adopted as a means of combination. It is further alleged that the producers employ various means to enforce their alleged agreement, including meetings, correspondence, and constraint upon members of the association who do not adhere to the agreement and upon resistant nonmembers.

The complaint says the average annual production of cast iron soil pipe, produced in widely separated parts of the country, is between 400,000 and 500,000 tons and that a great preponderance is shipped in carload lots. Purchasers, it is stated, consist chiefly of contracting plumbers and of wholesalers and warehousemen from whom also plumbers and builders frequently secure supplies.

The respondent producing companies are as follows:

Alabama Pipe Co., Anniston, Ala.; Anniston Foundry Co., Anniston; Anniston Soil Pipe Co., Anniston; Buffalo Pipe & Foundry Corp., Tonawanda, N. Y.; Central Foundry Co., New York City; Charlotte Pipe & Foundry Co., Charlotte, N. C.; Crown Pipe & Foundry Co., Jackson, O.; Drapery Hardware Co., Los Angeles; Eastern Foundry Co., Boyertown, Pa.; East Penn Foundry Co., Macungie, Pa.; Essex Foundry Co., Newark, N. J.; Fraters Valve & Fitting Co., Los Angeles; Goslin-Birmingham Mfg. Co., Inc., Birmingham; the Hajoca Corp., Philadelphia; Hedges-Walsh-Weidner Co., Chattanooga; Hercules Foundries, Inc., Los Angeles; Interstate Foundry Co., Anniston; Jakes Foundry Co., Nashville, Tenn.; Kilby Pipe Co., Anniston; Medina Foundry Co., Medina, N. Y.; Medina Iron & Brass Co., Medina, N. Y.; N. O. Nelson Mfg. Co., St. Louis; Pacific States Cast Iron Pipe Co., Provo, Utah; Pacific States Cast Iron Fittings Co., Los Angeles; Rich Mfg. Co., Ltd., Los Angeles; Rudisill Foundry Co., Anniston; Salem Brass & Iron Mfg. Co., Bridgeton, N. J.; Sanitary Co. of America, Linfield, Pa.; Sanitary Pipe Co., Alexander City, Ala.; Southern Pipe & Foundry Co., Inc., Knoxville, Tenn.; Southern Pipe & Foundry Co., Birmingham; Stringer Brothers Co., Inc., Chicago; Walker Machine & Foundry Corp., Roanoke, Va.; Walworth-Alabama Co., Attalla, Ala.; and Harry C. Weiskittel Co., Inc., Baltimore.

Officers of Cast Iron Soil Pipe Association named respondents are Wiley Alford, Attalla, Ala., president; Harvey D. Ritter, Linfield, Pa., vice-president; James R. Hedges, Chattanooga, treasurer; and I. W. Rouzer, Birmingham, executive secretary.

Twenty days from service of the complaint are given to file answers. Hearing has been set for Washington, April 30, but this is only a perfunctory determination and it may be delayed beyond that date inasmuch as attorneys for the commission and respondents usually confer and agree upon the date for hearings, which may be held at various points.

The Federal Trade Commission has also issued a complaint against Oliver Brothers, Inc., 417-421 Canal Street, New York, alleging violation of the so-called brokerage clause of the Robinson-Patman

Anti-Price Discrimination Act in supplying market information and purchasing service to wholesalers, jobbers and other dealers in various parts of the country. Eleven buying and selling companies also are named as respondents. Hardware is the chief commodity involved. Specifically, the FTC charges acceptance of commissions without rendering service. It is charged that Oliver Brothers, while acting as agent or representative of the buyers, accepted from the selling groups so-called brokerage fees or commissions, varying from 1 to 10 per cent of the quoted agreed sale prices, without rendering service of any kind to the sellers. Such commissions, it is charged, were in turn paid over by Oliver Brothers to its buyer clients, without the latter rendering any service to the sellers.

The complaint points out that it was impracticable to name specifically each of approximately 300 buyers as a respondent, but that all of them "are, or have been, engaged in practices similar to those alleged against the respondents named," who are said to be "fairly typical and representative members of a large group of wholesalers, jobbers, merchants and dealers" who have subscribed to the Oliver Brothers service. Similar comment is made as to selling companies.

May Tighten Exports Of Tin Plate Scrap

WASHINGTON, March 30.—Tightening up of the tin plate scrap export licensing act is proposed in identical bills introduced in the House by Representative Faddis, of Pennsylvania, and Hill, of Alabama. The bills would amend the act so as to include Hawaii and Puerto Rico under its provisions. They specifically exclude the Philippine Islands and Panama.

Representative Faddis told THE IRON AGE that the purpose of the proposed amendment is to prevent exportation of tin plate scrap, except upon license, to Hawaii and Puerto Rico and re-exportation to ultimate consuming countries. At present, virtually all American exports of tin plate scrap go to Japan.

Exports of tin plate scrap, under an act approved Feb. 15, 1936, by the President are allowable only upon licenses issued by the National Munitions Control Board, of which Secretary of State Hull is chairman. Licenses provide for a quota system of shipments by producers and dealers.

Administration Faces Problem of Making Income Equal the Outgo

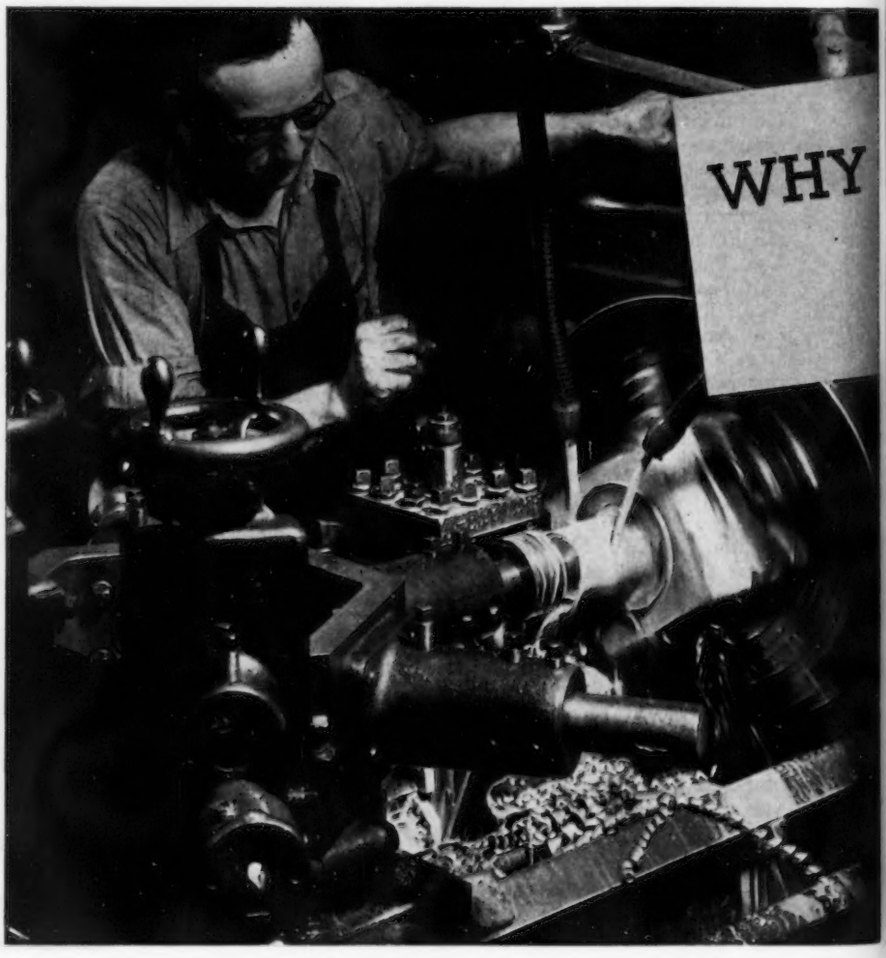
WASHINGTON, March 30.—The problem of eating one's cake and still having it remains eternal and unsolved.

In effect that is the problem with which the Administration has come to grips. Put into more definite form, the Administration is greatly perplexed over the matter of making the income exceed the outgo. As its fiscal situation now stands, the orgy of spending has made the outgo greatly exceed the income and the Federal Government now faces a ponderous debt that has mounted up to about $35,000,000,000—and it is increasing. Which means that the much-talked-of balanced budget remains only something that is talked of and nothing more.

To balance the budget there appear but two possibilities: Pare down expenditures or increase taxes. Neither alternative is a pleasant task for Washington. And still higher taxes are assuredly a sour thing to contemplate for industry, already groaning, along with the entire population, under taxes, direct and indirect, visible and invisible. Politically, spending affords intriguing emoluments by way of patronage and power. So politicians dislike to see the Treasury spigot shut off. Yet even they realize that economic disaster lies ahead unless an anchor is fastened to spending or taxes are upped again. But if they are boosted it is realized it will mean still higher costs of production and still higher prices, factors which already have Washington by the ears and up to its neck in "studies" of all sorts.

Eccles Fears Monetary Inflation

Marriner Eccles, Chairman of the Federal Reserve Board, wants the budget balanced quickly lest the Government run head on into monetary inflation. In a statement that is to his credit because of its forthright character, whatever objections may be made to it, he boldly urges "increasing taxes on in-



comes and profits if necessary to sustain the volume of relief and at the same time bring the budget into balance and permit the paring down of public debt as private debt expands." He manifested deep concern over rising wages and shortened hours and their inevitable companion piece-rising prices. Portents which if they get out of hand mean arrested production, and increased unemployment because sooner or later—or when his money gives out—John Q. Consumer will declare a sit-down strike.

On the Hill—that is, the Capitol, which harbors Congress — thumbs are down on tax increases. They always bring thunderous and ominous blasts from "back home." The Administration, too, speaking collectively, is against higher taxes. Individually, that isn't true, for certainly Mr. Eccles is a part of the Administration, and an important part, whose views are known to be shared by important Administration groups. Yet the Administration, while represented as opposing tax increases, has said little can be done to reduce Government costs and it has done little to reduce expenditures. The taxpayer, and his number is many, takes decidedly sharp issue with the "defeatist" contention that neither Government costs nor expenditures can be cut down much. The tremendous bureaucracy, with some 850,000 on the civil payroll, clearly could be extensively dismantled to the betterment of business and the country. So, too, is there other vast spending that is needless, which could be cut greatly and better provision made for legitimate relief needs.

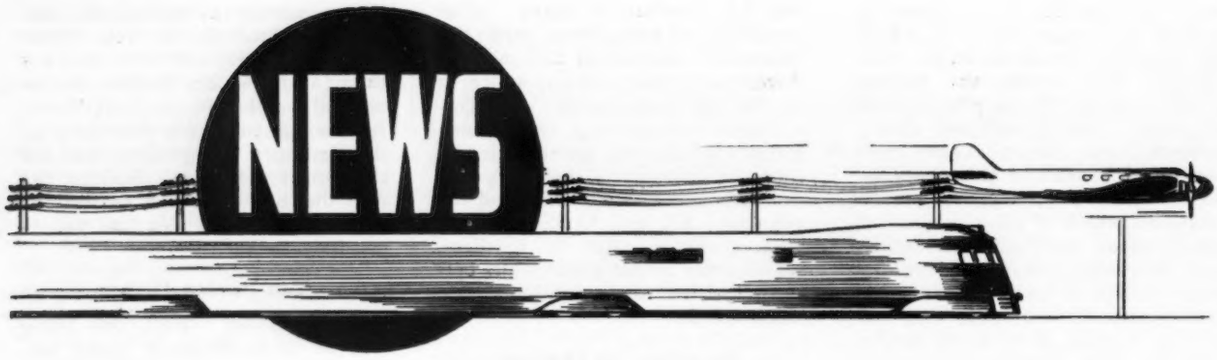
Spending Not Checked

Yet the spending proceeds apace as alarm rises within the Administration itself over price increases and concomitant factors, which are seen as fearsome forerunners of inflation, which, it is insisted, can be halted only by balancing the budget. Leaders in Congress, including Senator Harrison, chairman of the Finance Committee, disturbed over the Eccles statement, say emphatically there is no plan to kite taxes. His statement was followed by the declaration of the President that he "hopes" there will be no tax increases. On the heels of these expressions come disappointing March income tax collections, estimated to have fallen from $100,000,000 to $150,000,000 below expectations — this despite the increased corporation surplus levies. It was sad news for Secretary of the Treasury Morgenthau and for the country at large. Soaking the rich did not work out so well as proponents of the idea had prophesied.

Tax Burden Higher

What to do? Well, one thing will be to continue or make permanent existing nuisance taxes, which produce about $500,000,000 a year. But a study under way, which it is hoped will be even more productive of revenue, centers around the corporate surplus tax structure. There is a belief that through loopholes taxes that were due were never paid. The idea is to plug up the alleged loopholes, and this sort of legislation rather than legislation to increase levies may be proposed. The contention is made that corporations have paid stockholders dividends in shares and did not pay Federal taxes, maintaining that liability to do so rested with stockholders, who in turn also did not pay taxes, holding that liability to do so rested with the corporations. What may be the result of plugging up the loopholes, if they actually exist, remains to be seen. In any event, it is widely held it will fall far short of netting income that will be adequate to balance the budget. It is stoutly held that the real alternative that must be adopted if the budget is to be balanced and inflation avoided is to sharpen the knife of economy and cut a heavy slice off of expenditures.

And as for taxes, the sooner the Government can slash them — a prospect certainly not for the early future—the better for the Government and all its people—corporations and workers, which often are the same. For instance, the American Telephone & Telegraph has just reported to its 641,000 stockholders, a majority of whom are women, that taxes increased more than $22,000,000 in 1936, equal to $5.98 per share of common stock. Total taxes paid by the Standard Oil Co. of Kentucky have shot up to almost one-third of its sales. The steel industry pays in taxes from $3 to $4 or more per ton of finished steel. And is bellowed at for raising prices, made necessary to an important degree by taxes, plus higher wage costs and higher costs of raw materials. Until costs come down, prices remain up, and until the Government shows the way to lower costs by cutting its own expenditures its criticism about high prices has a hollow sound.



American Rolling Mill Co. To Spend $12,260,000 on Expansion Program

A $12,260,000 expansion and improvement program by the American Rolling Mill Co., Middletown, Ohio, to increase its production facilities and effect economies in operation has been announced by Charles R. Hook, president.

The program will be carried out with part of the proceeds of a $45,000,000 issue of preferred stock, convertible into common, which stockholders have been asked to authorize at the annual meeting April 15. Of the remainder, approximately $5,800,000 will be used to pay bank loans and other current liabilities and increase working capital and $25,000,000 will be applied to the refunding of the outstanding 5 per cent sinking fund gold debentures and the outstanding 6 per cent cumulative preferred stock, series B, which has been called for redemption April 15.

Plans call for the building of one or more open-hearth furnaces at the Kansas City, Mo., plant of the Sheffield Steel Corp., an Armco subsidiary; increasing the size of open-hearth furnaces at Butler, Pa.; and improving furnaces at Middletown. These improvements will result in an increase of approximately 250,000 tons over the present ingot capacity of 2,531,000 tons a year.

Pig iron production of the Armco plant at Hamilton, Ohio, will be increased approximately 100,000 tons a year through the installation and modernization of a blast furnace being moved from the company's inactive plant at Columbus, Ohio.

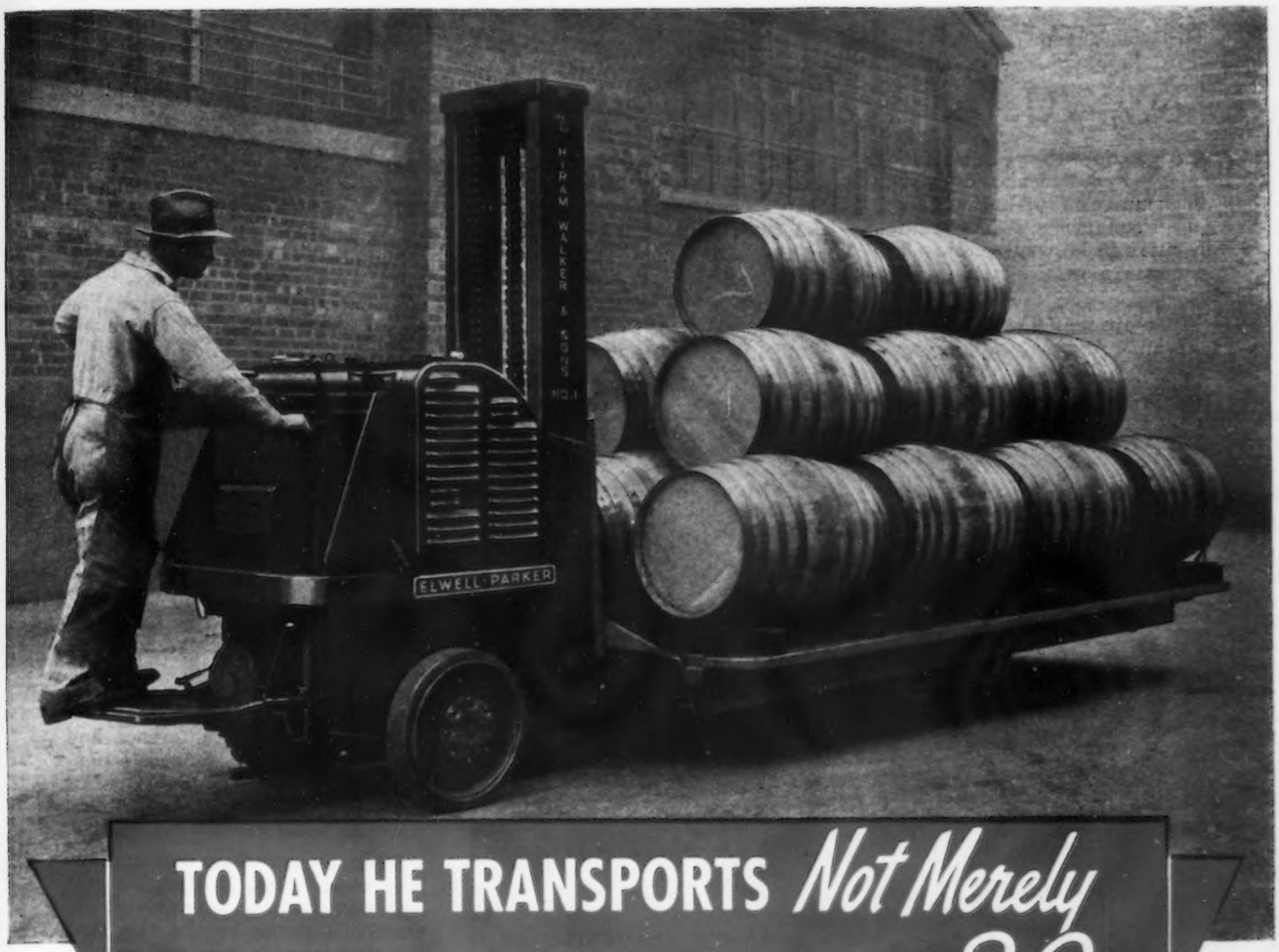
Approximately $1,500,000 is earmarked for investment in a rolling mill plant in Australia in participation with the John Lysaght Co. of England. Australia, long a good market for Armco products, has closed its ports to imports of sheet iron and steel and at the same time is increasing its requirements through the development of its own automobile industry, Mr. Hook pointed out.

Other items in the program include a new blooming mill in the company's Middletown plant to replace the old steam-driven mill; equipment at Butler for processing an increased production of stainless steel; additional soaking pits at Butler and Middletown; a research laboratory at Middletown; and miscellaneous improvements to effect further production economies.

Between a year and two years will be necessary to complete the program, Mr. Hook said.

Passing upon a complaint of the Midvale Co., the Interstate Commerce Commission has held that the rate of $6.60 per gross ton on scrap in carloads from Zanesville, Ohio, to Nicetown (Philadelphia), will be unreasonable in the future to the extent that it exceeds $5.49. The latter is based on 70 per cent of the basic scale of rates on iron and steel.

NEWS AND MARKET INDEX



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Alert Management can gain outstanding advantage over competition by watching continually for ways to reduce costs of load transportation. Are you "on the lookout?"

Long-trained Elwell-Parker Engineers are ready to help. Why not make a quick start—write for the name of our Representative nearest you? Elwell-Parker, 4225 St. Clair Ave., Cleveland, O.

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Over 200 Exhibits at Foundrymen's Show; 70 Technical Papers Listed

PLANS for the exhibition of foundry equipment and supplies in connection with the American Foundrymen's Association convention in Milwaukee, May 3 to 7, indicate a record breaking display.

With more than 75 classifications of machines and materials presented by nearly 200 firms, a greater variety of interest will be offered than at any previous show held in connection with the annual meeting of the association. In number of exhibits, the show will exceed the Detroit exhibition held in 1936. Although the facilities available have limited to some extent the size of a few individual displays, the total space occupied will be greater than in 1918 and 1924, the two previous years when foundry exhibitions were held in Milwaukee.

Probably the most important series of sessions of the program are the six pertaining to foundry management problems. An unusual effort has been made to secure outstanding speakers to cover such subjects as safety methods, occupational disease laws, job evaluation, foundry costs, and foreman and apprentice training.

This year's program of the safety and hygiene section is the most comprehensive the section has staged. Not only will employee safety be discussed in papers dealing with foot, leg, head and eye protection, but the effect of equipment maintenance on safety and general good housekeeping will be explained by recognized authorities on these subjects.

While the non-ferrous foundryman will find much of interest in the management and general interest sessions, the division is providing a round table conference and two other sessions confined to non-ferrous casting papers. One of these sessions will be devoted entirely to non-ferrous sand control.

That the gray iron industry has been most active in studying cast iron and methods of improving its quality is shown by the fact that this division this year will require four sessions for its program. Metallurgical and melting developments are stressed in the 14 papers which have been scheduled.

The steel division has scheduled four meetings, one a round table luncheon conference.

Melting developments, annealing cycles, sand control, physical tests of heat treated and fully annealed malleable iron and shrinkage studies will be the subjects stressed during the two malleable sessions, while the round table conference will have as its topic some of the newer annealing methods.

Shrinkage will receive considerable attention. A special pattern used by some 12 foundries, and how shrinkage is affected by the carbon ranges and other plant factors will be discussed.

This year's program emphasizes the increased attention given to sand control. In addition to the shop control course and the annual session on the technical developments as reported by the A.F.A. committee on foundry sand research, the non-ferrous and steel divisions each will devote a special session to a study of sand problems as applied to their branches of the industry.

Metal Industries Need Skilled Labor

A SCARCITY of highly skilled craftsmen already exists in the metalworking industries and is becoming increasingly acute, according to a study made public by the National Industrial Conference Board. Reports from companies in other industries including textiles, paper, printing, and lumber, indicate that in some sections there is a definite scarcity of certain types of labor, but that labor shortage has not yet become as serious a problem as in the metalworking industries.

The Conference Board's survey of conditions in the metalworking industries covered 404 companies employing approximately 467,200 workers. Of these companies, 21.4 per cent reported no skilled labor shortage; 26.5 per cent indicated that a serious scarcity of such labor existed; and 52.2 per cent reported that they had found it impossible to secure competent craftsmen to fill jobs that were open. This last group of 211 companies would employ a total of 7158 additional skilled craftsmen if they could be found.

The number of skilled craftsmen needed but unobtainable amounted to 1.53 per cent of the total employment of all companies reporting to the Conference Board. This figure varied considerably among the States from which a sufficient number of reports was received to justify the computation of separate state figures. In Rhode Island, the number of workers required but not obtainable amounted to 12.14 per cent of total employment by reporting companies; in Wisconsin to 3.15 per cent; in Michigan to 2.46 per cent; in Ohio to 2.18 per cent; and in New York to 1.27 per cent.

The Conference Board's analysis of the shortage of craftsmen by type of occupation in the metalworking industries indicates that more all-around machinists are required than any other type of worker. The companies reporting to the Conference Board needed 1889 such craftsmen. Other types of workers and the number required included: special machine tool operators, 1007; tool and die makers, 756; molders, 553; assemblers and erectors, 370; welders, 220; and core makers, 150.

There are a number of reasons, according to the Conference Board's study, why a scarcity of skilled labor exists while large numbers are still unemployed. The most important contributing cause was the suspension, during the depression, of most company training programs. Since it is conservatively estimated that 5 per cent of the skilled labor of the country withdraws from service each year because of death or obsolescence, practically 25 per cent of the skilled labor reserve was permanently lost during the depression, while very few replacements were being trained.

In addition, many skilled workers, either voluntarily or as a result of loss of jobs during the depression, abandoned their trades and secured other work. Many other skilled workers were promoted from the ranks of production workers, and world economic conditions, combined with immigration restrictions, shut off the former inflow of skilled artisans from Europe. Of serious social significance was the loss of skill by formerly competent craftsmen through prolonged inactivity and association with various "made work" relief projects that destroyed efficiency and work discipline acquired in industrial employment.

Shipping Methods Subject of Campaign

A SPECIAL effort to bring the packing, addressing and loading of all freight and express shipments up to recognized standards, to continue during the month of April, has been announced by the 13 Regional Shippers' Advisory Boards. Through their claims committees, which study the causes and prevention of loss and damage in transit, these boards have decided that they can be of much assistance to the carriers by inducing shippers and consignees to critically analyze their shipping methods.

Where shipments too frequently reach customers incomplete or damaged, both manufacturer and consignee will be asked to observe carefully whether the damage might have resulted from a deficiency in the article itself, the container or packing, in which case a report is to be made to the shipper. If, on the other hand, avoidable loss or damage apparently is attributable to faulty transportation, a report of the facts is to be made to the carrier with the consignee's suggestions for correcting the trouble.

Experience having shown that, in nearly every line of business, most carlot shippers have overcome virtually the entire risk of loss and damage, the efficient methods developed by those shippers will be made available to others who have not fared so well.

The program also contemplates that shippers themselves, whether or not they are receiving many complaints of damage, shall investigate the condition of their products upon delivery to the customer, who will be asked to advise shipper in such detail as will enable correction, of any shortage or damage found on receipt. This special check, the campaign committee explains, is necessary because a very large percentage of all claims are filed by consignees with the carrier, without informing the shipper of the occurrence.

Many Papers at Enameling Forum

A GREAT number of interesting subjects will be discussed at the first annual Porcelain Enamel Institute Forum to be held May 4 to 7, at the University of Illinois, Champaign, Ill. The program includes the following: "Symposium on Testing of Enamels," by W. N. Harrison, United States Bureau of Standards; "Milling Practice," by E. C. Aydelotte, Benjamin Electric Mfg. Co.; "Furnaces," by F. S. Markert, Ferro Enamel Corp.; "Pickle Room Practice," by B. T. Sweely, Chicago Vitreous Enamel Product Co.; "Processing of Leadless Cast Iron Enamels," by E. C. Porst, George D. Roper Corp.; and "Black Edging Practice," by Dr. J. E. Rosenberg, O. Hommel Co., Inc.

Following the forum, the institute will issue complete proceedings, which, in published form, are expected to form a valuable contribution to the literature on porcelain enameling.

Tata Steel Plant to Be Enlarged

H. A. BRASSERT & CO. of Chicago and London have been appointed consulting engineers by the Tata Iron & Steel Co. of India for an expansion program that will increase the annual ingot capacity of the plant at Jamshedpur to 1,250,000 tons. Main features of the program are a blast furnace, a section mill for medium sizes, a strip, hoop and rod mill, a semi-continuous wide strip mill and a tube plant, the latter to be built in conjunction with Stewarts & Lloyds of England. With the increased capacity, the Tata company will be able to supply about 80 per cent of the Indian demand for bars, rails, tie plates, sections, plates, sheets, tin plate, hoops, tubes, wire rods and wire.

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NORTH AMERICAN

COMBUSTION EQUIPMENT

LUMINOUS FLAME BURNER

PROPORTIONING VALVE

TURBO BLOWER

THE NORTH AMERICAN MANUFACTURING COMPANY

CLEVELAND, OHIO

Gear Makers Plan Spring Meeting

PAPERS relating to gear design, foundry practice, and plant management have been planned for the 21st annual meeting of the American Gear Manufacturers Association, to be held at the Galen Hall Hotel, Wernersville, Pa., May 24-25. They will include:

"Application Factors for Helical and Herringbone Speed Reducers," by S. L. Crawshaw, application engineer, Westinghouse Nuttall Works; "Automobile Transmissions," by J. O. Almen, dynamics division, Research Laboratories, General Motors Corp.; "Meehanite Iron," by O. Smalley, president, Meehanite Institute of America; and "Casting Steel in Concrete Molds," by H. F. Scatchard, Birdsboro Steel Foundry & Machine Co.

Also, "Plant Management," by N. M. DuChemin, assistant manager, West Lynn works, General Electric Co.; "Wage Incentives," by Neal Foster, Boston Gear Works, Inc.; "Foremen and Foremen's Training," by H. H. Kerr, president, Boston Gear Works, Inc.; and "Credit Unions," by E. S. Sawtelle, vice-president and general manager, Tool Steel Gear & Pinion Co., and president of the A.G.M.A.

J. C. McQuiston, Penn - Lincoln Hotel, Wilkinsburg, Pa., is manager-secretary of the association.

Railroad Car Orders Show Great Increase

The 42,212 freight cars on order March 1 constituted the greatest number for any corresponding date since 1926, when there were 50,947 on the books, according to the Association of American Railroads. On March 1, last year, the railroads had 12,679 cars on order, and on the same day two years ago, there were only 514.

Of the new freight cars, coal cars accounted for 22,240; box cars, 15,160; refrigerator cars, 3183; flat cars, 929 and stock cars, 700.

New freight cars placed in service in the first two months this year numbered 6135, the greatest number installed in any corresponding period since 1930. In the first two months last year, 1925 were put in service, while two years ago there were only 428.

On March 1, 375 steam locomotives were on order, the most since 1930, when 450 engines were on builders' order books. Electric and diesel engines on order totaled 10. Steam locomotives installed the first two months this year totaled 22 compared with one in the corresponding period last year and seven in the period two years ago.

A. S. T. E. Elects Officers

FRANK A. SHULER, master mechanic, Highland Park plant of the Chrysler Corp., has been elected national president of the American Society of Tool Engineers. Luke E. Beach, assistant master mechanic, Packard Motor Car Co., is first vice-president and Walter Wagner, master mechanic, Lincoln Division, Ford Motor Co., is second vice-president. C. Ray Brunner, of the tool engineering department, Dodge Brothers Corp., remains as secretary and Frank R. Crone, tool engineer, Lincoln Division, has been re-elected treasurer.

The new officers are all located in Detroit, but will be installed on April 8 at Toledo, at the time of the formation of a new Toledo chapter. Otto W. Winter, industrial engineer, Kent-Owens Machine Co., formerly chairman of the Detroit chapter, will assume office as chairman of the Toledo chapter.

A. S. A. Elects New Directors

PHILIP E. BLISS, president, Warner & Swasey Co., Cleveland; Leonard Peckitt, president, Warren Foundry & Pipe Co., and D. J. Kerr, assistant to the president and a director of the Lehigh Valley Railroad, have been elected to the board of directors of the American Standards Association.

J. Edgar Pew, vice-president, Sun Oil Co., Philadelphia, and H. P. Charlesworth, assistant chief engineer, American Telephone & Telegraph Co., were reelected.

Mr. Bliss was nominated by the American Society of Mechanical Engineers, Mr. Peckitt by the Cast Iron Pipe Research Association, Mr. Kerr by the Association of American Railroads, Mr. Pew by the American Petroleum Institute, and Mr. Charlesworth by the American Institute of Electrical Engineers.

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① Accurately controlled physical properties guaranteed to a given specification.

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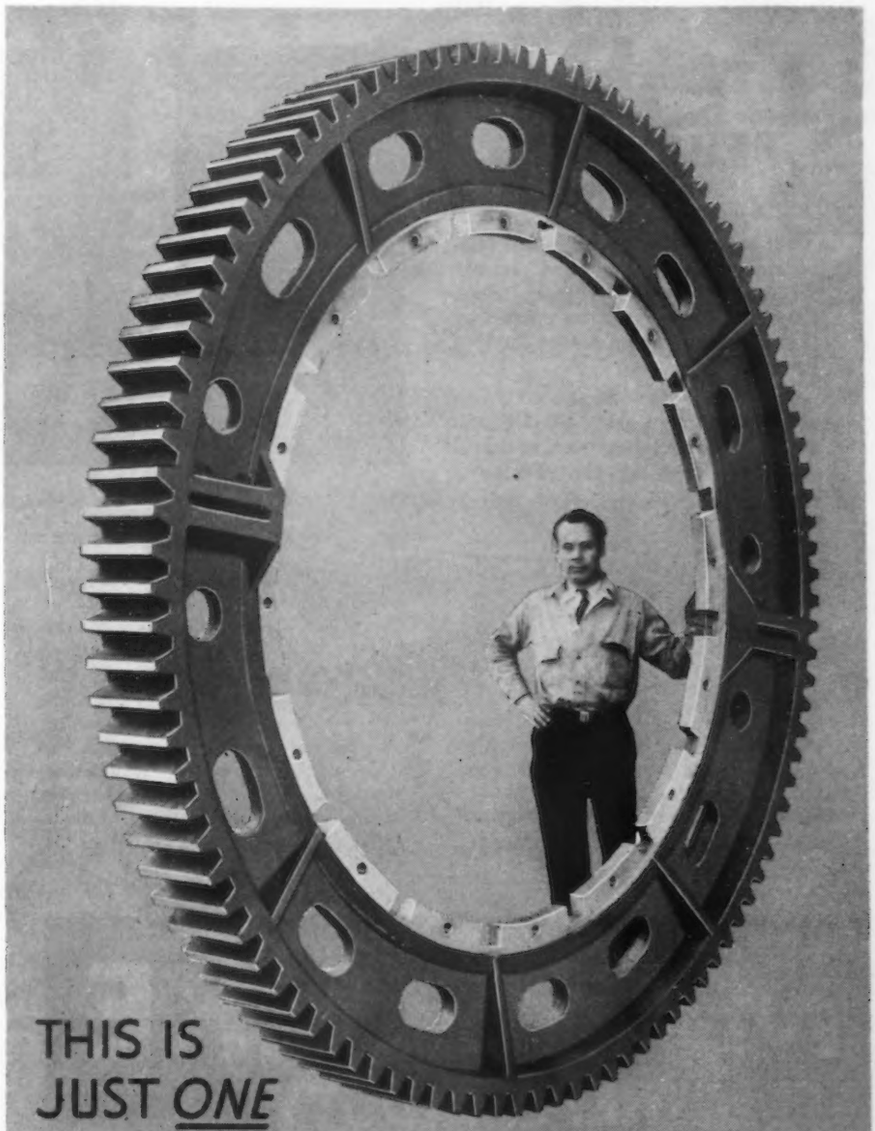

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Banner Iron Works.....St. Louis, Mo.
H. W. Butterworth & Sons....Bethayres, Pa.
Cincinnati Milling Machine Co. ..... Cincinnati, Ohio
Cooper-Bessemer Corporation. Mt. Vernon, Ohio
M. H. Detrick Company....New York, N. Y.
Farrel-Birmingham Co. .....Ansonia, Conn.
Florence Pipe Foundry & Machine Co..... Florence, N. J.
Fulton Foundry & Machine Co..Cleveland, Ohio
Greenlee Foundry Company.....Chicago, Ill.
G.H.R. Foundry Company.....Dayton, Ohio
Hamilton Foundry & Machine Co. ..... Hamilton, Ohio
Kanawha Manufacturing Co. ..... Charleston, W. Va.
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Vulcan Foundry Co.....Oakland, Calif.
Warren Foundry & Pipe Corporation..... Phillipsburg, N. J.

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I. A.

..PERSONALS..

A. L. GEORGE

M. J. KIST

A. L. GALUSHA

MICHAEL J. KIST has been appointed manager of sales, Lorain division, Carnegie-Illinois Steel Corp., to fill the vacancy caused by the retirement from active duty of ARTHUR L. GEORGE.

Mr. Kist began his business career with the Lorain Steel Co. in June, 1903, and has been continuously employed by that company and its successor. He started as a warehouse clerk and in turn became secretary to shop superintendent, secretary to estimating engineer, and estimating engineer. On Oct. 1, 1929, he was appointed chief of the estimating department and on March 11, 1936, was named assistant manager of sales, Johnstown products.

Mr. George, who is 65 years of age, has been employed by the company and its predecessors, the Johnson Co. and the Lorain Steel Co., continuously since August, 1895. He began as a draftsman and later went into the department of the office manager, making estimates and prices on products which at that time were chiefly special trackwork for street railways. He was given the title of estimating engineer for the Lorain Steel Co. and some years later became assistant general manager of sales. He became manager of sales, Lorain division, after the Lorain Steel Co. became part of the Carnegie-Illinois company.

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ALBERT L. GALUSHA, inventor of the Galusha clean gas generator, has become associated with the Wellman Engineering Co. as chief engineer of the line of Galusha gas equipment which the Wellman company has just acquired. Mr. Galusha will assume his duties April 1 at the company's Eastern offices, 30 Church Street, New York. He was graduated from Dartmouth College in 1899 with a degree of B. S. and took post graduate work in mechanical engineering at Massachusetts Institute of Technology. He has held important positions as head designer and mechanical consulting engineer, specializing on gas engines, gas producers and equipment. He is a member of the American Society of Mechanical Engineers and the author of articles on power plants in domestic and foreign publications.

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FREDERICK E. WILLIAMSON, president, New York Central Railroad, and CHESTER C. BOLTOM, former Cleveland Congressman, have been elected directors of the Cleveland Cliffs Iron Co., Cleveland. These two new directors are members of families that are said to be large owners of Cleveland Cliffs securities.

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HERMAN L. WECKLER, vice-president and general manager of the De Soto division, has been appointed vice-president of the Chrysler Corp. in charge of industrial relations. Mr. Weckler has had unusually wide experience both in industrial relations and in manufacturing operations. For four years prior to becoming general manager of the De Soto division, he was assistant to K. T.

IMPORTANT NEWS!!!

THE FIRST BASICALLY NEW INDUSTRIAL TRUCK CONTROL IN 15 YEARS

ROTOR-BRUSH

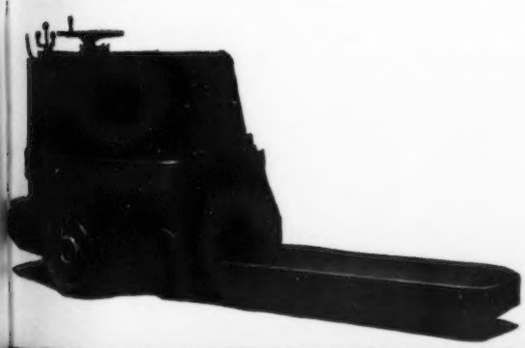
POWER FLOW CONTROL

● ROTOR-BRUSH Power Flow Control was developed by "AUTOMATIC" engineers to meet the demand for RELIABLE VOLTAGE CONTROL — SMOOTH POWER PERFORMANCE — LONG MECHANICAL LIFE — LOW MAINTENANCE COST.

● ROTOR-BRUSH Power Flow Control is so radically different in DESIGN — CONSTRUCTION — PERFORMANCE that it outmodes by far the conventional controllers now used.

●ROTOR-BRUSH Power Flow Control has successfully met every test of actual heavy duty service, a total of 3,000,000 cycles, equivalent to 16 Hr. per day operation for 3 years.

● ROTOR-BRUSH Power Flow Control will now be the new standard motor control to be EXCLUSIVELY used on every new "AUTOMATIC" INDUSTRIAL TRUCK TRACTOR AND CRANE.



Some important features of ROTOR-BRUSH Power Flow Control

1. Motor Type Brush Mounting Rotary Action — Not Stationary — Constant Spring Tension—Self Compensating — No Manual Adjustment — Larger Contact Areas—Low Voltage Loss.
2. Commutator Type Stator-Segments Unit Moulded in Permanent Insulated Bases—No Loose Segments—No Separate Parts
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9. Contactor Switch Control — Brushes Return to Neutral with No Voltage Load
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ELECTRIC AND GAS-ELECTRIC

MATERIAL HANDLING EQUIPMENT

PIONEER MANUFACTURERS OF POWER TRUCKS - TRACTORS & CRANES

KELLER, president of the corporation. Mr. Weckler received his early manufacturing training in the steel industry, having been associated with Jones & Laughlin Steel Corp. in Pittsburgh as shop engineer. In 1908 he joined the American Locomotive Co. in Pittsburgh in a similar capacity, and held that position until 1911, when he went with Buick Motor Co. and eventually became works manager for Buick, which position he held until he joined the Chrysler Corp. in 1932.

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EDMOND C. POWERS, who has been engaged for three years in technical writing for the Lincoln Electric Co., Cleveland, has been appointed assistant secretary of the James F. Lincoln Arc Welding Foundation. Prior to his work with the Lincoln company, Mr. Powers served the Penton Publishing Co. for four year as associate editor of two papers in the marine field. Following his graduation from Amherst College, he was associated with Rolls-Royce of America, Inc., at Springfield, Mass.

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GEORGE MCM. GODLEY, formerly president of the Burden Iron Co., Inc., Troy, N. Y., has been elected president to fill the unexpired term of ALFRED MUSSO, who has resigned. ARTHUR S. SWAN, vice-president, and FRANK HODSON, assistant to the president, have also resigned. O. A. VAN DENBURGH, JR., a former manager of the company, has been placed in charge of operations.

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L. A. VERBRYCK, for a number of years associated with the Pittsburgh Steel Co., has been made manager of the welded wire products division of the Wheeling Corrugating Co., Wheeling, W. Va.

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EDWARD T. BUTLER, who has been identified with the American Iron and Steel Institute, New York, since 1933, has resigned to become assistant manager of the Coal and Ore Exchange, Terminal Building, Cleveland.

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CLARENCE STANLEY has been elected a member of the board of the General Electric Co., Schenectady, N. Y. He is a son of William Stanley, one of the pioneers of the electrical industry and founder of the Stanley Electric Mfg. Co., which later became the Pittsfield works of the General Electric Co.

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VICTOR BROOK, who has been associated with *Machinery* in various capacities for the past 21 years, has been elected executive vice-president of the High Speed Hammer Co., Inc., Rochester, N. Y. His principal duties will involve product development, sales and advertising. He was formerly engaged in product and tool design with the Arrow Electric Co., Hartford; Noiseless Typewriter Co., Middletown, Conn., and the General Electric Co., Lynn, Mass.

VICTOR BROOK

J. P. MORRISSEY

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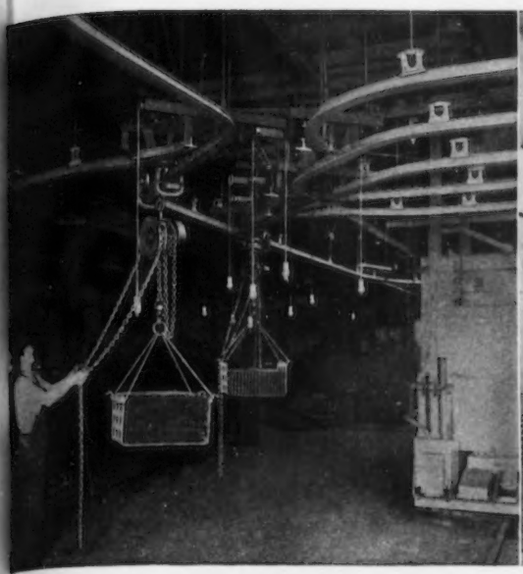
J. P. MORRISSEY has been appointed head of the weld rod sales division of the Harnischfeger Corp., Milwaukee. He attained nation-wide recognition with his interesting article in the *Saturday Evening Post* concerning his experiences as technical welding adviser for the Russian Government in 1930. Besides his experience in Russia as supervisor of the welding of locomotives and parts in

CLEVELAND TRAMRAIL MATERIALS HANDLING EQUIPMENT



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- Cleveland Tramrail helped modernize both the old and th new portions of this plant.
- Obsolete handling methods were replaced by moder Cleveland Tramrail, production speeded up, the "lifts an tugs" (potential cause of loss time injuries) were taken ou of materials handling.

CLEVELAND ALL WELDED CRANES FOR EVERY INDUSTRY

- **The Cleveland All Welded Crane** is the strongest crane per pound of weight. It is rigid — rugged — and designed for the hardest service.
- The welding of heavy girders presents problems not encountered in girders constructed of lighter sections.

Photo 2027

- The Photo 2027 shows a heavy girder of a soaking pit cran Note the heavy plates, heavy welds and reinforced top cov plate. A girder designed and built for hard work.

CLEVELAND CRANES

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THE CLEVELAND CRANE & ENGINEERING CO.

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WICKLIFFE, OHIO

Voronezh, his former connections also include six years as special representative on weld rods with the Crucible Steel Co. of America and some time with the Fusion Welding Corp. as Philadelphia district manager.

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MAYNARD J. CREIGHTON, general manager of the Zapon division of the Atlas Powder Co., Stamford, Conn., has been elected to the board of the powder company.

E. P. CRAWFORD, who for the past 15 years has been active in Pennsylvania in the mill supply and hardware field, has been appointed factory representative in that territory for the Billings & Spencer Co., Hartford. He will make his headquarters in Philadelphia.

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D. E. ACKERMAN, metallurgist for the International Nickel Co., New York, spoke on the special characteristics of non-ferrous metals at the Hall of Metal Products Exhibits in New York on March 29. The lecture was one of a series in the educational course in non-ferrous metallurgy which is being sponsored by the New York chapter of the American Society for Metals.

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HUGO M. MARQUETTE, sales manager of the George H. Smith Steel Casting Co., Milwaukee, recently reorganized as the Smith Steel Foundry Co., has been appointed production manager. HAROLD WALLIS continues as foundry superintendent. ADOLPH F. PETERS, chemist, has been appointed chief metallurgist.

W. A. JAYME, whose appointment as general superintendent of the Wood works, Carnegie - Illinois Steel Corp., McKeesport, Pa., was announced in these columns last week.

DEL S. HARDER, resident manager of the Grand Rapids Stamping division, General Motors Corp., is now general factory manager of all fabricating units of Fisher Body division, with headquarters in Detroit. GLENN S. CASHDOLLAR, formerly comptroller at Grand Rapids, is now resident manager. A. R. MCCALLUM remains as assistant manager in charge of production.

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TRIS SPEAKER, famous Cleveland outfielder, is now sales representative in Cleveland and Central Ohio for the Rotary Electric Steel Co., Detroit. His office is at 503 Guarantee Title Building, Cleveland.

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THOMAS BRADLEY has been named president of the Hupp Motor Car Corp., Detroit. Mr.

Announcing

GREATER FACILITIES

ADDITIONAL high frequency induction melting furnaces have recently been installed in our newly enlarged Alloy Steel Plant for the production of *Durimet,* "18-8," and other corrosion-resisting *low carbon* Alloy Steels.

Production capacity, by the installation of new equipment, has been tripled.

Single castings weighing as much as 2,000 pounds can now be produced in *low carbon* Alloys.

Many more individual pieces of equipment can be produced to your specifications within a given time.

Machine shop facilities have been improved likewise for greater and faster production.

To you this means a better-than-ever source of supply for corrosion-resisting low carbon Alloy Steel castings, rough or machined, as well as finished equipment.

You are invited to use these facilities whenever you have need for chromium-nickel, nickel-chromium or chromium-iron Alloy Steel castings and equipment.

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OF

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Bradley has been connected with the automobile industry since 1911, having at various times served with the Paige-Detroit Motor Car Co. and Graham-Paige Motors Corp. in executive capacities.

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JOHN GAILLARD, industrial engineer and mechanical engineer, American Standards Association, New York, has been elected vice-president on standards of the Society for the Advancement of Management, which resulted from a merger of the Taylor Society and the Society of Industrial Engineers. The board has empowered Dr. Gaillard to organize a committee to promote the knowledge and application of standardization as a major function of industrial management.

BERNARD E. SUNNY, Chicago, and JAMES S. WATSON, Indianapolis, have been elected directors of Link-Belt Co., Chicago, to succeed the late Arthur L. Livermore, and Austin L. Adams, resigned. Mr. Sunny is a director of a great many companies, among which are the General Electric Co., Illinois Bell Telephone Co., Public Service Co. of Northern Illinois, Wilson & Co., Chicago Surface Lines, and the First National Bank, Chicago. Mr. Watson is vice-president in charge of Indianapolis plant operations of Link-Belt Co., having served the company continuously for 44 years. They will serve as directors until 1941.

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H. A. WINNE, manager of sales, mining and steel mill section of the industrial department, General Electric Co., Schenectady, N. Y., will join the engineering department as general assistant to R. C. MUIR, vice-president in charge of engineering. J. J. HUETHER, present manager of sales, machinery manufacturers' section, will succeed Mr. Winne in the mining and steel mill section. S. W. CORBIN will take over Mr. Huether's position.

Mr. Winne joined the testing department of the company in 1910 after his graduation from Syracuse University. Through a series of promotions, he was transferred to the steel mill section in 1922 and became head of that section in 1930. Six years later he was appointed to the position he held prior to his present promotion.

Mr. Huether entered the testing department after his graduation from Notre Dame in 1923. The following year he became associated with the industrial department. He remained with that section until 1931, when he was appointed manager of sales, machinery manufacturers' section.

Mr. Corbin has been identified with the company since his graduation from Union College in 1930. He also joined the test course and was transferred to the section he now heads in 1931.

Westinghouse Electric & Mfg. Co., East Pittsburgh, had net income in 1936 of $15,099,291, compared with $11,983,380 in 1935. Orders booked in 1936 totaled $182,521,304, an increase of 48 per cent over the preceding year, and unfilled orders at Dec. 31, 1936, amounted to $48,490,919, compared with $27,137,075 at the end of 1935. During the year five dividends aggregating $5.50 a share on the common stock and preferred stock, were declared, representing a total outlay of $14,636,625. Taxes for 1936 amounted to $3.35 a share of capital stock.

Coke Output Higher in February

PRODUCTION of coke during February totaled 4,283,681 tons, the daily rate having been 154,728 tons, or highest since November, 1929. This compares with 4,629,532 tons for January, or 151,027 tons a day.

The production of by-product coke was 3,991,481 tons, while beehive output was 292,200 tons. The output of beehive coke rose from 10,458 tons a day in January to 12,175 tons a day in February, a gain of 16.4 per cent. In by-product coke, the daily rate increased over January by 1.4 per cent.

Continued activity in making pig iron has stimulated coke production, and during February output at furnace plants rose 2.4 per cent, although at merchant plants it decreased 1.5 per cent.

Stocks of coke on hand at by-product plants showed a decided decrease at the end of February compared with the end of January, the drop having been 14.7 per cent, most of which occurred at merchant plants.

American Cutting Alloys Reorganized

DR. ING. PAUL SCHWARZKOPF of Reutte, Austria, a prominent metallurgist, has accepted the presidency of the American Cutting Alloys, Inc., New York. Dr. Schwarzkopf is known for his pioneering work in the field of powdered metallurgy, and the invention of titanium cemented carbides for cutting of steel at high speeds. He is bringing to this country during the coming year several new developments from his laboratory, one of the most outstanding of which is a new element for electric furnaces. This element has satisfactorily maintained temperatures over 3000 deg. F. for periods over 900 hr. The element maintains a constant resistance with age, but increases in resistance with temperature.

Census Report on Steel Issued

THE activity of steel works and rolling mills in 1935, as reflected in employment and production, was far above the level recorded for 1933, according to preliminary figures compiled from the returns of the recent Biennial Census of Manufactures made to the Census Bureau in Washington.

Wage earners employed in the steel industry in 1935 numbered 359,546, an increase of 29.9 per cent over the 276,847 reported for 1933, and their wages, which totaled $439,668,575, exceeded the 1933 figure of $258,802,974 by 69.9 per cent.

The total value at f.o.b. factory prices of products made in 1935 in steel works and rolling mills amounted to $1,931,318,220, or 68.8 per cent more than the corresponding figure for 1933 of $1,149,889,074.

The tonnage of unrolled steel increased 48.5 per cent, from 23,162,713 tons in 1933 to 34,404,809 tons in 1935, and the output of finished hot-rolled products and forgings increased 50.5 per cent, from 16,160,603 tons to 24,318,077 tons.

Welding Course At Pittsburgh

A FIVE-DAY advanced course in arc welding design and practice is being arranged by the Lincoln Electric Co., Cleveland, for engineers, designers, welding supervisors and operators and others in the industries of the Pittsburgh district. It will be held April 19-23 at the Clifford B. Connelly Trade School Auditorium. The course, under the direction of E. W. P. Smith, Lincoln consulting engineer, will include lectures and technical papers, and free consultation on welding engineering problems. A fee of $5 will be charged for the complete course. The complete prospectus may be obtained from the company's Pittsburgh office, at 926 Manchester Boulevard, N. S., or from the company's welding engineering department at 12818 Coit Road, Cleveland.

Japan's Pig Iron Output A Record

TOKIO, Japan (*Special Correspondence*).—Statistics on the production of pig iron and steel in 1936, just issued by the Ministry of Commerce and Industry, show that all categories increased over 1935, in which year the output of iron ascended to an unprecedented high record.

The production of pig iron in Japan and Korea amounted to 2,219,049 metric tons, gaining 108,132 tons over 1935. In Manchukuo it amounted to 649,811 tons, an increase of 40,867 tons.

Details of steel production follow:

(In 1000 Metric Tons)

	1936	Gain Over 1935
Carbon steel, ingots and castings:		
Japan and Korea	4,914	510
Manchukuo	344	207
Cast steel:		
Japan and Korea	110	10
Carbon steel, market billets:		
Japan and Korea	132	22
Manchukuo	75	48
Carbon steel, sheet bars:		
Japan and Korea	357	132
Manchukuo	89	61
Tempered steel:		
Japan and Korea	72	9
Rolled steel:		
Japan and Korea	4,143	554
Manchukuo	136	111

A detailed account of the rolled steel output is subjoined:

Plate, under 17/64 in.:		
Japan and Korea	440	81
Manchukuo	29	25
Plate, other:		
Japan and Korea	927	207
Manchukuo	0.51	0.39
Tin plate: Japan and Korea	138	43
Bars:		
Japan and Korea	1,034	117
Manchukuo	65	55
Shapes: Japan and Korea	570	89
Rails:		
Japan and Korea	290	77
Manchukuo	39	30
Wire: Japan and Korea	438	30
Tubes: Japan and Korea	184	decr. 3
Strip iron: Japan and Korea	73	..
Others:		
Japan and Korea	48	..
Manchukuo	2.5	2.2

Of the total pig iron output the Nihon Seitetsu (Japan Iron Mfg. Co.) produced 171,000 tons, slightly less than in 1935, although ingots gained 30,000 tons over the preceding year. The relatively most remarkable item is the rail production in Manchukuo, which stepped up from 9425 tons to 39,160 tons. The only item that failed to reach the mark set in 1935 was steel tubing.

. . TRADE NOTES . .

Pennsylvania Pump & Compressor Co., Easton, Pa., has appointed a number of district representatives in the South as follows: McVoy-Hausman Co., 2019 Sixth Avenue, N., Birmingham; John A. Dodd, 101 Marietta Building, Atlanta, and Ryan Sales Corp., 160 Second Avenue, N., Nashville.

Foote Brothers Gear & Machine Corp., Chicago, has made the following changes in territorial sales personnel: E. G. Akridge, who has been handling the North Side of Chicago, has been appointed direct factory representative in the Detroit area, succeeding Thomas Lord, who has resigned. F. A. Emmons, Jr., takes over the territory vacated by Mr. Akridge, and Harry Harrison has been appointed sales engineer in the central section of Chicago.

Ajax Flexible Coupling Co., Westfield, N. Y., has moved its Pittsburgh office to 970-B Union Trust Building. J. Guy Griffith is in charge.

Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., has moved its New York office to 117 Liberty Street.

Brooklyn Steel Co., Inc., dealer in blank cold rolled and blue annealed steel sheets, has removed its warehouse from 190 Berry Street to larger quarters at 115 Banker Street.

Cleveland Steel Service, 1778 Lakeview Road, Cleveland, has started warehouse operations under the direction of Ernest W. Saunders and will market the special machinery steels of the Monarch Steel Co., Indianapolis. Mr. Saunders has operated in Cleveland for the past 25 years as district sales agent for various steel mills.

Ferro Enamel Corp., Cleveland, has added Ben MacDermott to the furnace building staff.

General Refractories Co. has appointed H. W. Porter & Co., Inc., 825 Frelinghuysen Avenue, Newark, as distributers in the Newark area.

Miles Machinery Co., Saginaw, Mich., has moved to 2025 East Genesee Avenue.

Tabor Mfg. Co., Philadelphia, has established an agency at 258 Glenwood Drive, Chattanooga, Tenn., under the direction of H. H. Reich.

William T. B. Miller has opened a steel warehouse at Front and Palmer Streets, Philadelphia.

B. F. Sturtevant Co., Hyde Park, Mass., has opened an industrial department to promote the sale and application of Sturtevant air handling equipment. J. C. Thompson, formerly manager of the company's Washington office, will be in charge, and will have his offices in Hyde Park.

Wheelco Instruments Co., Chicago, has moved offices and manufacturing facilities to 1929 South Halsted Street.

Graphitic Corrosion Of Iron Described

INVESTIGATIONS have shown that the rapidity with which graphitic corrosion of cast iron sometimes occurs may be due to local galvanic effects between the porous graphitic coatings and the underlying metal. The development of protective coatings is influenced by the size and distribution of the graphitic particles. Nickel alloy cast irons have favorable characteristics in this respect which probably account for their performance in many corrosive environments.

A new pamphlet, "Some Consequences of Graphitic Corrosion of Cast Iron," deals with the mechanism of a type of corrosion of cast iron that results in the formation of this type of surface layer of residual graphite. Copies of this paper are being distributed by the International Nickel Co., 67 Wall Street, New York.

Production of ferromanganese at the Natal works of the Union Steel Corp., Newcastle, South Africa, is to commence about July 1, 1937, according to an official announcement at Johannesburg reported to the Department of Commerce by American Commercial Attaché Samuel H. Day.

CONVENTIONS

APRIL 12 TO 15—American Chemical Society, University of North Carolina, Chapel Hill, N. C. Annual meeting. Dr. Charles L. Parsons, 728 Mills Building, Washington, secretary.

APRIL 14 AND 15—St. Louis Purchasing Agents Association's seventh annual member firm's product exhibition, in the Gold Room of the Jefferson Hotel, St. Louis.

APRIL 15 — National Council of American Shipbuilders, Whitehall Club, New York. Annual convention. C. C. Knerr, 11 Broadway, New York, secretary.

APRIL 19 TO 24—International Association for Testing Materials, London. Second international congress. K. Headlam-Morley, 28 Victoria Street, London, S.W.1, secretary.

APRIL 21 TO 23—SAE national tractor meeting, Pere Marquette Hotel, Peoria, Ill. John A. C. Warner, 29 West 39th Street, New York, secretary.

APRIL 26 TO 28—Chamber of Commerce of the United States, Washington. Annual meeting. D. A. Skinner, 1615 H Street, N.W., Washington, secretary.

MAY 4 TO 9—SAE summer meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. John A. C. Warner, 29 West 39th Street, New York, secretary.

MAY 5 TO 7—Porcelain Enamel Institute Forum, University of Illinois, Champaign, Ill. Robert G. Calton, 612 North Michigan Avenue, Chicago, president.

MAY 24 TO 27—National Association of Purchasing Agents, William Penn Hotel, Pittsburgh.

Japan to Control Steel Prices, Output

TOKIO, Japan (*Special Correspondence*). — The Ministry of Commerce and Industry has drafted an iron industry bill for presentation to the present session of the Diet, and will refer it to the Tekko Kyogikai (Steel Conference) shortly. The principal points of the bill concern production control and sales price control.

In this connection, it is pointed out that the proposed production control through the adoption of a license system is being strongly opposed by the steel circles. These circles contend that application of the license system to the steel industry is premature under the present conditions of the quasi-war time system. This problem will form a principal point of discussion when the conference meets to study the draft bill.

South America Handbook Available

THE "South American Handbook," of which the fourteenth edition has just appeared, is a comprehensive, compact, and thoroughly up-to-date annual compendium of general information about Latin America. Its 600 pages contain information about the governments, constitution, agricultural and mineral resources, coinage, transport, postal and other services of the 22 Republics stretching from Mexico to Tierra del Fuego. Each republic is dealt with individually, but there are systematic summaries of the air, railway, steamship and banking facilities of the whole continent, with separate sections devoted to sport, general products, and literature. This booklet is neatly printed, furnished with a number of good maps, and handy in size, and copies may be secured from the H. W. Wilson Co., 950-72 University Avenue, New York.

...OBITUARY...

R. H. CHERRY, since 1930 manager of the wire rope sales division of the Wickwire Spencer Steel Co., New York, died at his home in Westfield, N. J., on March 20, aged 44 years. He entered the steel industry in 1909 with the American Steel & Wire Co., where he remained until he enlisted for military service in the World War. After the war he returned to the American Steel & Wire Co., where he held various positions until he was placed in charge of wire rope sales in New York. He joined the Wickwire Spencer Steel Co. in 1930.

R. H. CHERRY

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JAMES WILLIAM BRAINARD, founder of the Brainard Steel Co. and the Brainard Rivet Co., Warren, Ohio, died in a Cleveland hospital March 28, aged 73 years. His first connection with the iron and steel industry with which he was long affiliated was at the age of 20 when he became associated with the P. A. Kimberley Co., steel manufacturer in Sharon, Pa. He became Cleveland district sales manager of the American Steel Hoop Co. in 1898. This was merged with the Carnegie Steel Co. two years later. He remained with the Carnegie company in a sales capacity until 1919, when he founded the Fowler Rivet Co., Warren, which later was changed to the Brainard Rivet Co. Three years later he organized the Brainard Steel Co., manufacturer of cold-rolled strip steel and served as president of both companies until his retirement in 1930. Since his retirement he had spent much of his time at his summer home at Henderson Harbor.

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BRADLEY P. WHEELER, an open-hearth executive of the Lackawanna plant of the Bethlehem Steel Co., died on March 24, after an illness of about four months. He was born in Buffalo, graduated from Central High School and took a job as laborer in the Pittsburgh plant of the Carnegie Steel Co., going later to the Bethlehem Steel Co., at Bethlehem, Pa., where he worked himself up to open-hearth superintendent. He went successively to Duluth, Minn., with the Minnesota Steel Co., to Portsmouth, Ohio, then to Lackawanna, where he was an open-hearth superintendent.

Acme Steel Co. To Expand

ACME STEEL CO., Chicago, will increase its Riverdale plant approximately one-third as measured by square feet of floor space. New units will include offices, a warehouse, and manufacturing space.

Armco's 1936 Sales Largest in History

SALES of $101,463,383, the largest of any year in its history, and net profit of $6,441,676, the largest for any year since 1928, are reported for 1936 by the American Rolling Mill Co. in its annual report to the stockholders.

The 1936 earnings were equivalent to approximately $2.73 a share on the average number of shares outstanding during the year, and compare with a profit in 1935 of $4,310,127, equal to $2.41 a share. Earnings for the last year include $420,000, representing royalties received for the years 1937-40 on a license issued to an English company for use of the continuous sheet rolling process.

The company's sales last year contrast with $76,799,385 for 1935 and with the depression low of $27,294,322 in 1932. Sales in 1929 were $70,434,232.

During the year its long-term debt was reduced from $45,262,559 to $24,940,493, this being the net reduction after redemption and conversion of certain bonds and creation of a new debt of $3,600,000 through acquisition of complete ownership of the Hamilton Coke & Iron Co., Hamilton, Ohio.

Wellman to Build New Gas Generator

WELLMAN ENGINEERING CO., Cleveland, has added to its line of products the Galusha gas generator, which produces industrial gas from small anthracite coal or coke breeze. This generator is said to produce a uniformly clean, high-grade and dependable gaseous fuel, since the fuels used do not yield tar, providing a gas that is particularly adapted to industrial heating operations in which the quality of the product requires care to avoid discoloration, scaling, pitting or spotting. Cost of producing the gas is claimed to be considerably below that heretofore regarded as the minimum cost for producing quality gas from these fuels.

This new gas generator will be marketed as the Wellman-Galusha clean gas generator in standard units with hearth diameters from 18 in. to 10 ft. The capacity of each unit, it is said, will be unusually high, varying with the grade and character of the fuel used.

The Wellman company has acquired from Albert L. Galusha, the inventor and patentee, the exclusive right to manufacture and sell the Galusha gas generator within the United States and its possessions.

It has long been a manufacturer of the Wellman mechanical gas producer, which uses bituminous coal as fuel. With the addition of the Galusha clean gas generator the company will be able to supply either clean gas generators or hot raw gas producers for the various industries which can use gaseous fuels.

Steel Prices Rise Sharply in Japan

QUOTATIONS for iron and steel products in the Japanese market have registered a startling increase since the latter part of October, according to a report received in the Bureau of Foreign and Domestic Commerce from American Trade Commissioner Paul P. Steintorf, Tokio.

Peak levels were reached in the middle of January, when quotations for leading items were approximately double those which prevailed early in November, 1936. For example, the highest price quoted for ⅝-in. round steel bars per metric ton during the week ended Nov. 7, 1936, was approximately $29. During the week closed Jan. 15 of the current year it had risen to approximately $62.

A combination of influences has been instrumental in bringing about this sharp price increase. The marked shortage of pig iron and scrap iron has been the outstanding contributor to the existing condition, and this has been accentuated further by anticipation of an "inflation boom" based on the large Government budget for the coming fiscal year, it was stated.

Other factors include the reported certainty of a sharp consumption increase in connection with the "military replenishment" program, and the strong upward price trend throughout the world, the trade commissioner reported.

Mullins Mfg. Co. To Buy Warren Plant

MULLINS MFG. CO., Salem, Ohio, is negotiating for the purchase of the Youngstown Pressed Steel Co., Warren, Ohio, and the acquisition of the Warren plant has been approved by the directors of the Mullins company subject to ratification by the stockholders at a meeting to be held April 27.

The Youngstown Pressed Steel Co. is a wholly owned subsidiary of the Sharon Steel Corp., Sharon, Pa. It manufactures kitchen cabinets, washing machine tubs and other pressed steel products and also stampings.

Granite City Steel's 1936 Profit $288,687

GRANITE CITY STEEL CO. earned 75c. a share on its outstanding capital stock in 1936, the net profit of $288,687 reported for the year being equivalent to 75c. a share, including the 127,496 shares issued during the year. This compares with net earnings of $618,358 in 1935, which was equal to $2.42 on the smaller amount of stock outstanding.

The 1936 sales totaled $10,117,911, or $2,034,840 more than in 1935, although last year they were adversely affected by a construction program which curtailed the company's production of sheets. Current assets shown on the 1936 balance sheet were down to $3,634,780, due to expenditures, while current liabilities were $2,043,525.

Keystone Steel & Wire Co. is expected to show net profit of approximately $350,000 for the three months ended March 31, according to W. H. Sommer, president. This will compare with actual net for the same period of last year of $332,646, which was equivalent to 44c. a share.

Steel Workers Form Independent Union as SWOC Continues Drive

PITTSBURGH, March 30.—The employee representation plan took the labor spotlight during the past week with the general bodies of two large steel producers making known their intentions to stick to this type of organization in their collective bargaining negotiations with management.

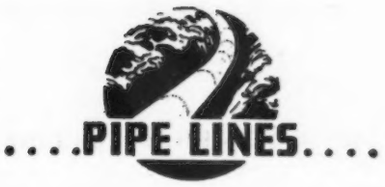
As indicated a few weeks ago, employee representatives in the Pittsburgh - Youngstown district plants of Carnegie-Illinois Steel Corp. have set up a definite plan to make their organization an independent employee union separated from both the company and professional union organizations. The plan to be voted on at each plant provides for monthly dues of 25c. a member, with an initiation fee of $1. A plant executive committee of employee representatives with power to adjust disputes not settled by department representatives is also part of the set-up.

Important also is a provision for a central executive committee to negotiate with the president of the corporation on problems not settled in the various plants. Compulsory arbitration on all problems not settled by the corporation's president and the employee representatives is also part of the strategy recommended for making the company union an independent organization.

Employee representatives will act as organizers for the new organization; which is to be known as the American Union of Steel Workers. It is also understood that white collar workers will be invited to sign up. This plant union will undoubtedly be similar to the one established some time ago in the Chicago district by Carnegie-Illinois' employees who did not want to belong to either the SWOC or the plan of employee representation. The Chicago group is known as the Steel Employees Independent Labor Organization. Meanwhile, employee representatives at Jones & Laughlin's Pittsburgh works have voted 28 to 1 to stand solidly behind the plan of employee representation as a vehicle for collective bargaining with their management. According to company union leaders at this plant, the representatives feel that this particular method of negotiating fits their purpose better than an outside union.

The SWOC continues to obtain contracts on behalf of union members with some of the smaller steel and associated concerns. Following an outlaw strike of less than two hours last week, Allegheny Steel Co. officials and SWOC representatives signed a contract similar to those reported a few weeks ago. All employees returned to work upon the announcement of the agreement. It is understood that Mesta Machine Co. officials are also meeting with SWOC representatives preparatory to signing an agreement on behalf of union members. To date, 31 companies have signed agreements with the SWOC.

Pittsburgh branch of the Lincoln Electric Co. will give an intensive course of instruction on arc welding design and practice at the Clifford B. Connelly Trade School auditorium, Pittsburgh, from April 19 to 23, inclusive. Practical demonstrations at 2 p.m. and 4 p.m. each day will be given.



Pennsylvania Counties Gas Corp., Brookston, Pa., has authorized new 4½ and 2½-in. welded steel pipe line from connection with main system at Cherry Run, Pa., to plant of Sheffield Glass Bottle Co., Sheffield, Pa., about nine miles, for natural gas transmission.

Public Service Co. of Indiana, Indianapolis, plans welded steel pipe line for natural gas transmission to Lafayette, Ind., where system will be converted from artificial to natural gas distribution, with extensions and replacements in pipe line distributing system, control and distribution station facilities and other installation.

Ak-Sar-Ben Natural Gas Co., Oxford, Neb., plans welded steel pipe line from trunk system to Farwell, Neb., for natural gas transmission to latter place, where distribution station and system will be installed. Company has been granted similar franchise at Ravenna, Neb., and will install steel pipe line distributing system at that place. Franchises have been asked at St. Paul, Loup City, Ord, Burwell and other neighboring communities in Nebraska for natural gas distribution and systems.

Saskatoon, Sask., plans welded steel pipe line from natural gas field in Lloydminister, Sask., district to city limits for natural gas transmission and distribution. Cost close to $125,000. G. D. Archibald is city engineer.

A. O. Smith Corp., Milwaukee, has secured contract for about 2500 tons of welded steel pipe from an unnamed interest.

Barnsdall Pipe Line Co., Tulsa, Okla., has let contract to Williams Brothers Corp. for a 70-mile, 6-in. Lindewelded oil pipe line from Placedo oil field in southern Texas to refinery to be built by Barnsdall company near Corpus Christi, Tex.

Minneapolis, St. Paul & Sault Ste. Marie is inquiring for four 4-8-4 type locomotives.

Youngstown & Northern has purchased four 900-hp. diesel-electric locomotives, two from American Locomotive Co. and two from Electro-Motive Corp.

Central of Georgia has ordered 500 50-ton box cars from Pullman-Standard Car Mfg. Co. and 100 steel-sheathed auto-furniture cars from American Car & Foundry Co.

Canadian Pacific has placed orders for 30 passenger-train cars, including 21 coaches and one cafe-parlor car, frames for these cars to be built by National Steel Car Corp. and cars finished at Angus shops of Canadian Pacific. Two baggage and express cars and five mail and express cars are to be built by National Steel Car Corp.

Lehigh & New England is inquiring for 100 cement cars.

The Pennsylvania will build 11 electric locomotives in its own shops.

Missouri Pacific has awarded four 600-hp. and two 900-hp. diesel locomotives to Electro-Motive Corp.

RAILS AND TRACK SUPPLIES

Canadian Pacific is placing rail orders as follows: 14,200 tons of 100-lb. R.E. section with Algoma Steel Corp. and 6680 tons with Dominion Steel & Coal Corp. In addition, 8710 tons of 85-lb. C.E. section will be rolled by Algoma Steel Corp.

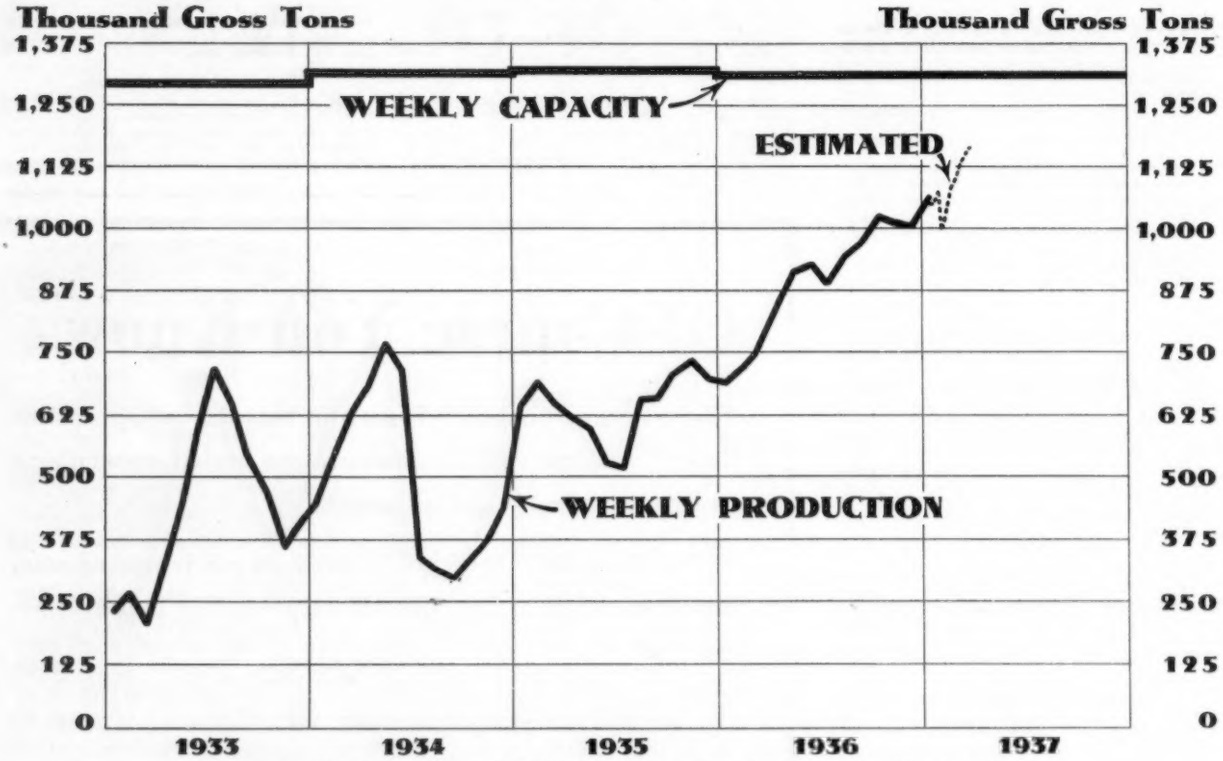
Denver & Rio Grande Western has applied for authority to issue $2,175,000 in equipment trust certificates to aid in financing purchase of 10 freight and five passenger locomotives and 100 70-ton all steel ballast cars. Orders for locomotives have been placed with Baldwin Locomotive Works, while orders for cars which are to be built for Roger-Ballast Car Co. have been placed with American Car & Foundry Co.

Southern Railway will open bids April 9 on the following equipment to cost about $14,000,000, to be paid for in cash: 2500 40-ton steel-sheathed box cars; 500 40-ton steel-sheathed automobile cars; 1100 50-ton all-steel hopper cars and 1500 50-ton all-steel gondola cars, to be drop-bottom and 250 low-side type.

All axles, including driving axles, on 50 new 4-6-4 steam locomotives now being built for New York Central by American Locomotive Co. will be equipped with Timken tapered roller bearings.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week
Pittsburgh	94.0	93.0
Chicago	83.5	83.5
Valleys	88.0	88.0
Philadelphia	68.0	60.0
Cleveland	78.0	82.0
Buffalo	92.0	91.0
Wheeling	99.0	99.0
Southern	77.5	77.5
Ohio River	87.0	82.0
Western	91.5	91.5
St. Louis	88.0	88.0
Detroit	100.0	100.0
Eastern	93.0	98.0
Aggregate	91.0	90.0

Weekly Booking of Construction Steel

FROM THE IRON AGE

	Week Ended				Year to Date	
	Mar. 30, 1937	Mar. 23, 1937	Mar. 2, 1937	Mar. 31, 1936	1937	1936
Fabricated structural steel awards	35,550	18,900	10,700	17,150	323,595	287,765
Fabricated plate awards	12,270	2,670	1,845	510	48,275	84,965
Steel sheet piling awards	275	0	2,100	160	14,930	14,905
Reinforcing bar awards	2,985	2,120	2,380	8,500	42,055	118,555
Total Lettings of Construction Steel	51,080	23,690	17,025	26,320	428,855	506,190

. . . SUMMARY OF THE WEEK. . . .

. . . Production of steel almost equals that of record-breaking May, 1929.

o o o

. . . Mills enter second quarter with large backlogs extending into August.

o o o

. . . Steel virtually being rationed in effort to prevent overloading of order books.

THE steel industry enters upon the second quarter of the year with production almost equal to that of the record-breaking month of May, 1929, and with backlogs in some products that extend well into the third quarter.

Output of ingots is estimated at 91 per cent of the industry's capacity, or about 1,191,882 tons for the week, which compares with the all-time peak of 1,193,284 tons a week in May, 1929, when operations exceeded 100 per cent of the then rated capacity.

Bookings of sheets extend through August, such orders having been taken at prices in effect at time of shipment. On other products the mills have backlogs sufficient for varying periods of from one to three months. The most backward items are structural steel and pipe, which are affected by the failure of building construction to show its usual seasonal expansion, although mills have fairly substantial specifications for projects closed during the past few months.

Next to sheets, the product in heaviest demand is tin plate. Can manufacturers, who are covered on contract for the nine-months' period from Jan. 1 to Oct. 1, will take all the tin plate that the mills can supply within that period. In consequence of the large domestic consumption many attractive export inquiries are being turned down. An advance in the official tin plate price is a possibility within the near future, even though it would affect only a small portion of the shipments to be made before next Oct. 1.

THE volume of steel business in March was extremely heavy. Most companies booked more tonnage than they did in either December or January, the two most recent peak months. A considerable portion of the recent tonnage consisted of specifications for identified construction projects, on which there was a March 31 deadline for contracts placed in January, with April 30 as the final date on specifications for February and March contracts.

The real test of the steel market will not come before June, as very few mills need any additional tonnage for April and May, and it is expected that the normal flow of orders will soon fill up any June schedules that are open. The present problem of the mills is not to sell steel but to avoid loading up their own order books to unwieldy proportions. Moreover, most companies have adopted a system that virtually amounts to the rationing of steel among regular customers in proportion to their normal requirements. Every possible effort is being exerted to prevent the building up of excessive inventories by customers, and under this method buyers do not always obtain the amount of steel for which they inquire. As a further means of holding in check any speculative buying, the mills will take nothing at second-quarter prices that cannot be shipped by June 30. By these means the mills hope to protect themselves against a sharp decline in production, although nothing of this kind is immediately in sight. Nevertheless, there is growing opinion among thoughtful members of the industry that the situation is too good to be healthy, and precautions are accordingly being taken.

THE scrap market is higher at Chicago, but elsewhere has leveled off in the absence of important consumer buying. Scrap brokers, however, look for a further upward move in view of the heavy consumption. THE IRON AGE scrap composite has advanced to a new high for 14 years of $21.92. By-product coke at Chicago is 75c. a ton higher. Demand for coke has been large as a protection against a soft coal strike, but indications are that a compromise agreement will be reached by the operators and the United Mine Workers. A bill was introduced in the United States Senate on Tuesday to regulate exports of scrap.

March pig iron shipments were fully 50 per cent above those of February, and second-quarter production of merchant iron has been almost completely sold. Foundries have fairly good stocks. but furnace stocks have been greatly reduced.

. . . PITTSBURGH . . .

. . . Large backlogs assure continued high steel operations for some time.

o o o

. . . Sheets are being sold for August shipment, with strong demand still prevailing.

o o o

. . . Acute shortage of steel is being most keenly felt in semi-finished market.

PITTSBURGH, March 30.—Pittsburgh ingot output has moved up fractionally this week to 94 per cent of capacity, and the Wheeling district continues unchanged at 99 per cent. Large backlogs and the firm intention of mills to clear all second quarter price material by June 30 point to a continuation of the present high operating rate for some time. Minor recessions, if they occur, will be more in the nature of production difficulties than lack of orders.

Meanwhile, total bookings during March greatly exceed February business, even on a daily basis. Backlogs are further extended than was the case at the beginning of the year and, with a much larger than expected volume of fresh business at second quarter prices, it is evident that some time will pass before unfilled tonnage can be worked down to any great extent. Bookings of sheets, strip, wire, and to a lesser extent bars, are being received at close to a normal rate. Sheet orders for August shipment indicate plainly the sold-out condition in this market, and a sharp dropping off in specifications has yet to occur.

Orders for heavy structural steel and plates are on the increase. Plates totaling 12,000 tons have been ordered for two of the four ore boats recently contracted for by the Pittsburgh Steamship Co. The remainder of the requirements is expected to be placed in the near future. Railroad buying in the past week has been light, with Central of Georgia closing contracts for 600 box cars.

The acute shortage of steel which has been prevalent for some time is being felt especially in the semi-finished market, where demand is outrunning supplies. Equally important is the large number of foreign inquiries involving substantial tonnages which are going unsatisfied at this time. Tin plate specifications continue in good volume, with operations remaining at 100 per cent.

Some apprehension over the coal wage negotiations is being felt, but the consensus of opinion seems to be that, even though the question is not immediately settled, an extension of the contract will materialize.

Pig Iron

Shipments and production continue at a fast pace. Some producers have found it necessary to allot tonnages for second quarter shipments as far as some grades of iron are concerned. With foreign inquiry increasing and domestic consumption showing gains, there is no assurance that supplies will adequately meet the heavy demand. Steel production in some cases is being retarded owing to insufficient iron.

Semi-Finished Steel

Bookings so far this month are substantially ahead of those of February. For the most part these orders represent urgent requirements as there has been an absence of stocks at both consumers' and producers' plants for several months. The movement of sheet bars is exceptionally heavy and in some cases nonintegrated makers of sheets are unable to obtain the desired amount of steel. Tin bars are also in good demand since tin plate operations have been close to 100 per cent for the past several months. Foreign inquiry for wire rods is going unsatisfied because of the heavy demand from domestic users.

Bolts, Nuts and Rivets

Specifications continue in good volume. Miscellaneous bookings are at a high rate and automobile companies unaffected by shutdowns are active. Business from car builders has been in steady volume for several months, but the acceptance of sample cars will be followed by additional heavy tonnages.

Bars

March bookings are substantially ahead of those placed in February, even on a daily basis. Incoming business exceeds shipments and backlogs average about eight weeks. No let-up in pressure for delivery has occurred and shipments to automobile makers, farm implement manufacturers and machine tool makers are heavy. Contrary to the general expectations, bar orders at second quarter prices have been in good volume. There is little doubt that this is due to customers anticipating their requirements because of the delivery situation. A large number of miscellaneous customers who were unable to anticipate the price advance are, in some measure, responsible for some of the fresh business.

Cold-Finished Bars

Although the majority of large customers were able to cover some of their future requirements before the price advance, there were undoubtedly quite a few who did not do so judging from the volume of specifications at second quarter prices. Production and shipments are at a fast pace and in most cases there is urgent demand for steel. Especially is this true with regard to farm implement and machinery manufacturers. The bulk of business going on the order books at this time is emanating from widely diversified sources. Not a few nonintegrated makers are experiencing difficulty in obtaining hot-rolled bar stock.

Steel Sheet Piling

The majority of awards continue to be for projects requiring less than 100 tons. Incidentally, the total of this type of business is in better volume than a year ago. Jones & Laughlin Steel Corp. will furnish 275 tons of piling for a

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous: Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Mar. 30, 1937	Mar. 23, 1937	Mar. 2, 1937	Mar. 31, 1936
Rails, heavy, at mill	$42.50	$42.50	$39.00	$36.37½
Light rails, Pittsburgh	43.00	43.00	38.00	35.00
Rerolling billets, Pittsburgh	37.00	37.00	34.00	28.00
Sheet bars, Pittsburgh	37.00	37.00	34.00	28.00
Slabs, Pittsburgh	37.00	37.00	34.00	28.00
Forging billets, Pittsburgh	43.00	43.00	40.00	35.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	43.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	1.80	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.20	1.85
Bars, Chicago	2.50	2.50	2.25	1.90
Bars, Cleveland	2.50	2.50	2.25	1.90
Bars, New York	2.78	2.78	2.55	2.20
Plates, Pittsburgh	2.25	2.25	2.05	1.80
Plates, Chicago	2.30	2.30	2.10	1.85
Plates, New York	2.53	2.53	2.33	2.09
Structural shapes, Pittsburgh	2.25	2.25	2.05	1.80
Structural shapes, Chicago	2.30	2.30	2.10	1.85
Structural shapes, New York	2.5025	2.5025	2.3025	2.06¼
Cold-finished bars, Pittsburgh	2.90	2.90	2.55	2.10
Hot-rolled strip, Pittsburgh	2.40	2.40	2.15	1.85
Cold-rolled strip, Pittsburgh	3.20	3.20	2.85	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	2.80	2.40
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	2.90	2.50
Sheets, galv., No. 24, Pittsb'gh	3.80	3.80	3.40	3.10
Sheets, galv., No. 24, Gary	3.90	3.90	3.50	3.20
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.15	1.85
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.25	1.95
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.25	2.95
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.35	3.05
Wire nails, Pittsburgh	2.75	2.75	2.50	2.10
Wire nails, Chicago dist. mill	2.80	2.80	2.55	2.15
Plain wire, Pittsburgh	2.90	2.90	2.60	2.30
Plain wire, Chicago dist. mill	2.95	2.95	2.65	2.35
Barbed wire, galv., Pittsburgh	3.40	3.40	3.05	2.50
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.10	2.55
Tin plate, 100 lb. box, P'gh*	$4.85	$4.85	$4.85	$5.25

* Practically the equivalent of previous quotations owing to a new method of quoting, effective Jan. 1, 1937.

Pig Iron

Per Gross Ton:	Mar. 30, 1937	Mar. 23, 1937	Mar. 2, 1937	Mar. 31, 1936
No. 2 fdy., Philadelphia	$25.76	$25.76	$23.76	$21.3132
No. 2, Valley furnace	24.00	24.00	22.00	19.50
No. 2, Southern Cincinnati	23.69	23.69	21.69	20.2007
No. 2, Birmingham†	20.38	20.38	18.38	15.50
No. 2, foundry, Chicago*	24.00	24.00	22.00	19.50
Basic, del'd eastern Pa.	25.26	25.26	23.26	20.8132
Basic, Valley furnace	23.50	23.50	21.50	19.00
Malleable, Chicago*	24.00	24.00	22.00	19.50
Malleable, Valley	24.00	24.00	22.00	19.50
L. S. charcoal, Chicago	30.04	30.04	27.54	25.2528
Ferromanganese, seab'd carlots	95.00	95.00	80.00	75.00

† This quotation subject to a deduction of 38c. a ton for phosphorus content of 70 per cent or higher.

* The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$23.75	$23.75	$21.75	$15.75
Heavy melting steel, Phila.	20.25	20.25	18.75	13.75
Heavy melting steel, Chicago	**21.75**	21.25	20.25	14.75
Carwheels, Chicago	21.25	21.25	19.50	14.00
Carwheels, Philadelphia	20.00	20.00	18.50	14.75
No. 1 cast, Pittsburgh	**20.25**	19.75	18.75	15.25
No. 1 cast, Philadelphia	22.25	22.25	19.25	14.25
No. 1 cast, Chicago (net ton)	17.00	17.00	17.00	13.00
No. 1 RR. wrot., Phila.	20.00	20.00	18.75	13.25
No. 1 RR. wrot., Ch'go (net)	19.00	19.00	18.50	13.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.25	$4.25	$4.25	$3.65
Foundry coke, prompt	4.50	4.50	4.50	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	16.25	16.25	15.00	9.25
Lake copper, New York	16.37½	16.37½	15.12½	9.37½
Tin (Straits), New York	**65.25**	64.00	54.75	47.20
Zinc, East St. Louis	7.50	7.50	6.80	4.90
Zinc, New York	7.85	7.85	7.15	5.27½
Lead, St. Louis	6.80	6.80	6.85	4.45
Lead, New York	6.95	6.95	7.00	4.60
Antimony (Asiatic), N. Y.	17.00	17.00	16.50	13.50

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
March 30, 1937	2.605c. a Lb.	$23.25 a Gross Ton	$21.92 a Gross Ton
One week ago	2.605c.	23.25	21.75
One month ago	2.330c.	21.25	20.25
One year ago	2.084c.	18.84	14.75

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1937	2.605c., Mar. 9	2.330c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	$21.92, Mar. 30	$17.92, Jan. 4
1936	2.330c., Dec. 28	2.084c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Procurement Division project at Charleston, S. C.

Reinforcing Bars

Scarcity of steel and heavy backlogs on other products are responsible for a substantial unfilled tonnage of concrete bars. While numerous jobs are pending, awards in the past week have been meager. National Milling Co. at Milwaukee is inquiring for 600 tons of rail steel for the construction of a grain elevator.

Plates and Sheets

Backlogs of plates and shapes continue to increase, and the proportion of privately financed projects has shown no falling-off compared with Government-sponsored jobs. A contract has been let for the construction of two Lake ore boats requiring 12,000 tons of plates. These boats are for the Pittsburgh Steamship Co., subsidiary of U. S. Steel Corp. The American Bridge Co. received the award for 1600 tons of material for the construction of a bridge at Point of Rocks, Md. It will also fabricate 350 tons of plates and shapes for the Rustless Iron & Steel Co. building at Baltimore. Numerous jobs involving less than 100 tons of plates and shapes have been awarded since the first of the year and in the aggregate constitute a considerable volume of business.

Railroad Buying

With a substantial number of inquiries having come out recently, awards are expected in the near future. Central of Georgia have ordered 500 50-ton box cars from Pullman Standard Car Mfg. Co. and 100 40-ton box cars from American Car & Foundry Co. In addition to a previous inquiry, Lehigh & New England is inquiring for 100 cement cars. A majority of car builders are working close to capacity and the reentrance of railroads into the market for more rolling stock points to a continuation of activity throughout the next six months at least.

Sheets

Specifications for sheets continue in excess of shipments and there seems to be no end to the heavy volume of business. Producers are being subjected to constant pressure for deliveries which, incidentally, have been further extended. Several grades of sheets are not obtainable in less than 21 to 23 weeks. The mere thought of a late July or early August shipment is causing some consumers considerable worry. As a result, "shopping around" has been indulged in but has been of no avail. Meanwhile, substantial foreign inquiries have been turned down because producers wish to expend all their efforts in getting out domestic business. The volume of unsatisfied foreign inquiries has grown into an impressive figure and it is expected that this business will continue to overhang the market. Prices offered for some export business are $4 a ton above domestic quotations.

Strip

Specifications continue in normal flow with mills not making much headway in paring down backlogs. Miscellaneous sources are specifying at a good rate and the total volume of fresh business at second quarter prices is close to the normal rate. There has been a tendency for a few of the smaller consuming industries to lighten up in their demand; however, this condition is not general.

Tin Plate

Packers' can specifications and general line can bookings continue to increase and there has been no change in the operating rate of approximately 100 per cent. Most mills are committed for all of the plate they will be able to produce through August or September.

Tubular Products

Finishing mill schedules and shipments are heavy as the result of a large number of specifications placed before the price increase. Mills will be busy for the next month or so on both old and new business and it is expected that a considerable replenishment of mill and jobber stocks will be necessary before pipe production slows down. Meanwhile the steady increase in home building is making a dent in jobbers' stocks. Deliveries on some sections of line pipe are fairly well extended. Large line pipe inquiries are expected shortly.

Wire Products

Backlogs are exceedingly heavy on both manufacturers' wire and merchant wire items. Demand is greater than the volume of tonnage which producers are willing to place on the order books. Present finishing mill schedules are at a high rate and are restricted only by shortage of steel. Meanwhile, there has been no let-up in foreign inquiry and higher than domestic quotations are still being offered.

Coal and Coke

As the deadline for a wage settlement draws near, coal production is rolling along at an abnormal rate as customers stock as much coal as possible. At this writing no decision has been reached, although there is a good possibility that in case a settlement is not made by April 1 the conference will be continued. The coke situation is tighter than ever, with demand for furnace coke greater than the supply. Foreign inquiry on furnace coke make a few weeks ago remains unsatisfied.

. . . *Steel and pig iron output remains high.*

BUFFALO, March 23. — Open hearth operation remains about as before, with Bethlehem's Lackawanna plant using 28 to 29 out of 30 units. Republic Steel Corp.'s operating eight furnaces and Wickwire-Spencer Steel Co., 2.

A considerable volume of small fabricated structural and reinforcing bar business is moving, but few sizable jobs have been placed. A local maker has the contract for 100 tons of structural steel for a bridge to be built by Erie County at Williamsville, N. Y.

Pig iron business is steady, with operations remaining the same as before.

. . . *Pig iron buyers covered for second quarter.*

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. . . *Demand for steel is still strong.*

ST. LOUIS, March 30.—The demand for finished steel, especially sheets and plates, continues at a heavy rate. The mills are reported to be booked to their capacity on sheets for second quarter, and are accepting orders for third quarter delivery at prices that may prevail then. Deliveries on plates are 10 to 11 weeks. Specifications for structural shapes have been heavy in recent weeks, as fabricators are eager to specify tonnages under contracts which expire tomorrow. Wire products are moving at a lively rate from jobbers' warehouses to dealers. Illinois will have open bids April 2 for highway bridges requiring 310 tons of structural.

Buying of pig iron has slowed down to almost nothing, and, with the exception of a carload now and then, it is not believed there will be much more buying for second quarter, nearly every melter having made commitments for requirements for the coming three months. March is expected to be the biggest month of the year for shipments, although makers have been trying to hold shipments down to avoid congestion. The melt in the St. Louis area continues at a peak rate. Agricultural implement manufacturers are operating as much as they possibly can, and it seems likely now there will be no early shutdown, and that they will operate all summer.

Ingot operations continue at better than 88 per cent of capacity.

. . . *Steel backlogs continue to mount.*

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. . . *Good demand from Great Britain.*

TORONTO, Ont.—With the exception of a minor falling off in sales due to the Easter holidays, business in the Canadian iron and steel markets showed little change from the preceding week. Officials of the steel companies state that backlogs continue to mount, and inquiries for various materials for future delivery are being received. Producers, however, are taking only short term contracts, and there seems to be uncertainty with regard to delivery on some lines. Plant operations are continuing at the highest level in years. There is a good demand for iron and steel and their products from Great Britain. Demand for steel for domestic consumption also is on the upgrade.

In the merchant pig iron markets sales are holding at a high level. Melters continue to enter the market at frequent intervals for spot supplies, and orders ranging from 100 to 500 tons are fairly numerous. Melters continue to complain of difficulty in obtaining scrap and as a result are using more pig iron. Foundry iron has a steady call and some melters have covered for second quarter needs while others have issued inquiries. Prices are firm and unchanged.

Demand for iron and steel scrap is advancing at a good rate and dealers state that there is not sufficient material coming in to take care of the demand, and yard holdings are being depleted. Mills are not obtaining all the material they require.

Lincoln Electric Co., Cleveland, has added W. H. Borst and E. A. Webber to the sales staff of its New York office, 330 West 42nd Street. Mr. Webber was formerly with the company's Chicago office.

. . . . CHICAGO . . . .

. . . Steel output continues at 83½ per cent of district capacity.

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. . . Mills have large second quarter backlogs, with sales running into third quarter.

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. . . Fabricated structural steel is backward at time of usual seasonal expansion.

CHICAGO, March 30.—Ingot production remains at 83½ per cent of capacity, and users' immediate needs are not being satisfied in full. New buying is still on a broad scale and steel mill books are filled for the quarter on some products. Tonnages are being taken for delivery after July 1 at prices in effect at time of shipment.

The rush of pig iron business is taxing shipping facilities to the limit and producers of foundry coke are scrambling to keep abreast of demand. The acuteness of a threatened shortage grows worse each day.

A new railroad equipment buying program is in sight, and steel mills look for active buying of both rails and equipment before the summer months have passed.

A bad spot in the business picture is evident in the wire market as affected by dealer sales in the Missouri River Valley, where several years of bad weather have cut the resources of the farmers. However, wire moving to the manufacturing trade is in large volume and new buying is on a broad scale.

Fabricators of structural steel are worried about the outlook. Fresh inquiries in this area are far from impressive and backlogs are dwindling at a time when they should at least be stationary with definite prospects of growing.

Pig Iron

March shipments are topping the February movement by 50 per cent, and the scramble to take tonnages has not reached its peak. New buying is on a very broad scale and some sellers now have the largest bookings in their history. All merchant stacks, with the exception of one, are lighted, and that one is being relined. Furnace stocks are at a post-depression low.

Coke

April prices for foundry coke are $10.20 a ton at Chicago ovens. an advance of 75c. from the quotations which prevailed at the end of March. Production and demand are nip and tuck, with the threat of a serious shortage becoming greater.

Cast Iron Pipe

New prices for cast iron pipe 6 in. and larger and in lots of less than 200 tons, are $47 a ton, Birmingham, or $55. delivered Chicago. Steel companies at Cleveland and Chicago have been in the market to satisfy plant expansion needs and other industries are following this lead. Contractors' tonnages are making a better showing, but buying by municipalities and utilities is slow. PWA programs are all but exhausted in this area, but WPA is still signing for new tonnages. Sellers do not find the market active on a broad scale, but their hopes for spring and summer are pitched rather high.

Sheets

Buying continues in large volume at those mills which are willing to take third quarter commitments with prices to be set as of date of shipment. This practice is not favored by all producers and it therefore has not become a universal practice. though it is probable that before another week passes most sellers will be in line. The delivery situation is beyond immediate solution as all mills are operating at capacity and cannot offer anything for the second quarter and on some products are booked well into the third quarter.

Bars

New buying has been exceptionally heavy in the last few days and mills have little more than a small assortment to offer. Deliveries on such tonnages are pushed ahead as far as 10 weeks. The speculative feature is of high importance in the bar market, where users are not only trying to assure deliveries but are trying for protection against higher prices as well as inflation in general. All major consumers are participating in this market and smaller users are limiting activity in accordance only with the size of their bankrolls.

Plates

Influx of new business is large and plate mill deliveries are stepping ahead in accordance with the general situation. Miscellaneous tank orders are larger, but most of the large oil storage business is passing to the east and south of Chicago. However, this business is not being missed because of the excellent condition of the railroad equipment market. There are still orders with car builders against which no steel has been shipped to date and new business of large size is in the making. The Central of Georgia has ordered 600 cars.

Rails

Mills are concentrating all activity upon making deliveries of old commitments, but they are not unmindful of the prospect that additional purchases may be in order about June, when track-laying will have progressed to the point where accurate estimates can be made of requirements above those now on order.

Structural Material

Awards include 2600 tons for the Sanitary District, Chicago, taken by Bethlehem, and 400 tons for a store building in Chicago awarded to American Bridge Co. All other allotted tonnages are small, but they disclose an unusual number of industrial expansion projects. Railroad business is limited to light bridge repairs. Shop backlogs are lighter and some fabricators are beginning to view the situation with alarm because this should be an active contracting time of the year. They wonder if buyers are beginning to resist the higher steel quotations.

Wire Products

Mill production is at 85 per cent of capacity and is not keeping pace with specifications, which are pushing deliveries farther into the fu-

ture. New buying is brisk and books are all but filled for the second quarter, there being no practical way in which sellers can check the speculative attitude of buyers. Consumption of the manufacturing lines is heavy, but there is a note of worry concerning the movement of dealers' lines in the Missouri River Valley, where several years of unfavorable conditions have drained the resources of farmers. An acute rod shortage exists and efforts of one producer to get relief from another are failing.

Reinforcing Bars

The rush by consumers to take protection before the $7-a-ton advance appears to have taken the cream off the market for several months to come. Dealers, in accepting protection contracts, have been forced to expand steel stocks. New extras, which take effect April 1, also add to the rush, and so fabricators are left with a bag full of orders which are stripped of the higher prices which the industry has so earnestly sought. An interesting phase of this protective contracting is that it discloses marked activity in the form of industrial plant expansion.

. . . Pressure for deliveries is unabated.

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. . . Production to continue at high level.

BIRMINGHAM, March 30.—Pressure on the mills and furnaces for deliveries is unabated, with the result that production schedules remain at high points and likely will for quite a while. Producers are being flooded with specifications against bookings already placed and cannot keep up with the requests of customers. Last week the call for bars, plates and shapes was especially heavy. Steel business, at the new prices, is filtering in at a fair rate, but the chief problem of the market now is one of production rather than of selling. Unfilled tonnage on the books of producers will last for some time.

Pig iron producers, likewise, have very few market worries for the next month or so, as they are also heavily loaded with forward tonnage. One producer is practically out of the market for the second quarter. A few sales are being made at the new $20 base, these coming from customers who underestimated their requirements or failed to anticipate the rapid advances of the market.

It is reported that the Gulf States Steel Co. will blow in its blast furnace at Gadsden in May. This furnace has been idle for more than five years.

Present operations are steady, with 16 blast furnaces and 18 open hearths active. This number operated last week and schedules this week are unchanged.

. . . Mills virtually filled up on sheets for second quarter.

CINCINNATI, March 30. — Sheet steel ordering is still at greater than capacity rate, although mill books are almost filled for the second quarter. In fact, the leading district interest is out of the market on all types of sheets except stainless and electrical grades. While automotive ordering is curtailed through labor disturbances, the general demand is more than enough to offset easing in that field. Shipments are increasing steadily, with March rated as the heaviest month in the history of the Middletown unit of American Rolling Mill Co. Export business is being held to quotas equal to business of last year, and excess tonnages offered at premiums are being refused. All mills in the area are now completely recovered from recent flood damage and operations are at capacity.

Melters hesitate to contract beyond current requirements for pig iron. Specifications against contracts are unusually heavy as consumers seek to move all material under commitment. Foundry operations are about 90 per cent of capacity, as melters seek to catch up with business delayed by the recent flood. Virtually all foundries are operating full weeks with some running extra heats.

Movement of foundry coke is heavy. Oven interests are trying to allocate shipments to immediate consumers rather than to those seeking to build up inventories. Prices are steady.

Buhler, Kan., plans pipe line for trunk water supply from new water source, to be developed soon, to municipal limits, about four miles. Fund of $35,000 is being secured through Federal aid for this and other waterworks extensions. Hefling & Hughes, Hutchinson, Kan., are consulting engineers.

State Board of Charities and Corrections, Pierre, S. D., plans pipe line for water supply at State hospital near Kankton. S. D., to connect with city lines at last noted place. Fund of $30,000 has been authorized. D. W. Loucks, State Capitol Building, Pierre, is State engineer.

Georgetown, Miss., closes bids April 6 for pipe lines for water system and other waterworks installation. W. A. Sitts, Hazlehurst, Miss., is consulting engineer.

Weymouth, Mass., plans extensions in water pipe lines and other waterworks installation. Fund of about $95,300 has been authorized for work. Board of Selectmen will be in charge.

Amite, La., plans pipe lines for extensions in water system and other waterworks installation. Cost about $54,500. Financing is being arranged through Federal aid.

Ishpeming, Mich., plans extensions and improvements in water system, replacing present wooden mains. Cost about $76,000. Financing has been arranged through Federal aid.

Sioux City, Iowa, has authorized immediate call for bids for 200 ft. of 24-in., 5600 ft. of 12-in., 10,000 ft. of 6-in., and 2000 ft. of 4-in. for water system. Paul D. Cook is city engineer.

Charlotte, N. C., has authorized bond issue of $1,365,000 for extensions and improvements in water system, including new force pipe line for main supply, about six miles, and other lines for distribution, with three main feeder lines in different parts of city; also elevated steel tanks and towers, one of 1,000,000-gal. capacity, and two of 500,000-gal. each; extensions in filtration plant and other waterworks installation. J. B. Marshall is city manager in charge.

Bureau of Water, Altoona, Pa., plans 8 and 6-in. pipe for extensions in water system in Eldorado district. Financing is being arranged through Federal aid. H. J. Baum is city engineer.

Republic, Ohio, plans pipe lines for water system and other waterworks installation. Special election has been called on April 6 to vote bonds for $45,000 for project. Financing will be carried out through Federal aid.

Board of Princess Anne County Supervisors, Princess Anne, Va., plans pipe line for main water supply in East Ocean View district. Fund of $11,000 has been authorized.

Pasadena, Cal., has awarded 615 tons of 6 and 12-in. to United States Pipe & Foundry Co. and 385 tons of 8-in. to National Cast Iron Pipe Co. for a water system.

Seattle, Wash., has awarded 500 tons of 2, 3, 4, 6 and 8-in. for two WPA projects to Crane Co.

Burbank, Cal., has awarded 100 tons to an unnamed bidder.

Los Angeles Department of Water & Power has awarded 306 tons of 8-in. to National Cast Iron Pipe Co.

. . PHILADELPHIA . .

. . . New-priced tonnage being received at good rate, and March may be best month of the year, so far.

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. . . Specifications for identified projects help swell sellers' order books.

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. . . Operations increase to 68 per cent of capacity.

PHILADELPHIA, March 30.—March bookings are running ahead of those of February and will exceed those of January, which was a good month for most sales offices. Backlogs are being reduced only by two or three mills, which are refusing to quote on practically all inquiries except those from regular customers in an effort to improve their delivery situation. A great deal of tonnage has been taken the past week for specific projects at first quarter prices.

The Pennsylvania Railroad is specifying heavily on its car program, but has not yet made announcements regarding the outcome of last week's bidding for the construction of 2300 cars. It was learned today that this road plans to build 11 new electric locomotives, more of which may be required later when the Paoli to Harrisburg electrification is completed.

Inquiries have been issued by New York Shipbuilding Corp. for 544 tons of plates for a Gulf Oil tanker and 3586 tons for each of one to three vessels for the Panama Railroad Co. Pusey & Jones Corp. is asking for bids on 725 tons of plates for a Standard Oil of New Jersey tanker. Bids will be opened Thursday by the Maritime Commission for the long-delayed construction of a cabin liner for the United States Lines to replace the Leviathan.

The strike at the Lebanon, Pa., plant of Bethlehem Steel Co. is over, following a poll of workers which indicated that the majority by far preferred to return to work. Normal operations were resumed last Thursday and no interruptions or disturbances have been reported.

A revision of the figures for open-hearth activity has resulted in an eight-point increase, the district now operating at 68 per cent of capacity.

Pig Iron

Spot business is negligible, but shipments are heavy and the demand is still great, as is evidenced by the report from one seller that between 7000 and 8000 tons of domestic inquiry has been turned down in the past few weeks. Another states that it will enter the second quarter with nearly all old orders filled, stocks depleted, and second quarter output practically all sold. It is believed that most furnaces are in this same situation, so that it may become extremely difficult for small users of iron who are unable to anticipate their needs to secure their requirements. Additional price increases are being talked of, but some sellers are fearful of another advance so soon, lest it add to the weight of what may be already a top-heavy structure.

Plates and Sheets

Plates are in good demand, with shipbuilders and railroads both specifying and inquiring actively. Deliveries are running close to 12 weeks now in larger companies, while two of the mills that might be able to capitalize on speedier shipment at this time are finding it difficult to take care of their regular trade, let alone buyers who go elsewhere as a rule, but have been attracted to them by their comparatively short delivery promises. Incidentally, these two mills are refusing to quote on practically all business at the moment in what seems to be a determined effort to reduce their backlogs. Another mill has kept away from specific jobs as much as possible so that its shipping schedule will be relatively open. A good amount of sheet business has come in during the past week in spite of the greatly extended deliveries for nearly all grades. Some sheet shipments have been held up for the Edward G. Budd Mfg. Co., and the Philco radio plant because of the Chrysler strike. It has been reported that an export broker was unable to place 25,000 tons of galvanized sheets.

Wire Products

Only a small amount of business is coming in at the new prices as yet. Little can be taken for second quarter in high-carbon strip or wire, but there is still some room for low-carbon orders. Nails are being quoted for delivery in eight to 10 weeks. The regular resale price on nails for jobbers is $3.25, but it has been reported that some jobbers who overbought are selling at as low as $2.80 until their stocks are down to normal.

Structural Shapes

A school in Camden involving 325 tons of shapes went to Bethlehem Fabricators, Inc., while an addition to the Campbell soup plant in Camden, requiring 310 tons, was awarded to Belmont Iron Works. American Bridge Co. was awarded 245 tons for a bridge in Lycoming County, Pa. Bids will be taken April 9 in Harrisburg on about 2000 tons of shapes for highway bridges in Westmoreland-Indiana, McKean, Clearfield and Cameron counties.

Imports

The following iron and steel imports were received here during the past week: 1217 tons of chrome ore from Cuba; 1 ton of steel sheets, 56 tons of steel tubes, 93 tons of steel forgings, 80 tons of wire rods, 10 tons of steel billets and 22 tons of steel bars from Sweden.

Fabricated Steel Orders Decline

ORDERS for structural steel booked during February declined to 88,946 tons from 130,651 tons in January, according to the American Institute of Steel Construction. This was below the tonnage placed in February, 1936, and represented but 38 per cent of the normal monthly volume.

Shipments during the month were little changed from January, the total having been 91,848 tons as against 92,020 tons. Due, however, to the large backlog of orders accumulated prior to January, the tonnage still available for fabrication is estimated at 493,832 tons. compared with 414,365 tons at the end of February, 1936.

Pig Iron and Ferroalloys Output in 1936 Was 31,029,187 Tons

THE American Iron and Steel Institute has issued its annual report for 1936 (reproduced below) on production of pig iron and ferroalloys. Total output of pig iron was 30,216,547 gross tons, while ferroalloys production amounted to 812,640—a total of 31,029,187 tons of both pig iron and ferroalloys.

PRODUCTION OF PIG IRON AND FERRO-ALLOYS

	1932	1933	1934	1935	1936
PIG IRON:					
Pennsylvania	2,103,180	3,728,839	4,244,566	5,479,792	9,102,875
Ohio	2,387,028	3,918,723	4,207,944	5,634,530	7,206,655
Indiana, Mich.	1,034,801	1,469,783	2,184,546	2,898,478	4,168,299
Illinois	919,280	1,012,676	1,269,154	2,003,388	2,917,016
Alabama	652,898	900,170	1,171,650	1,297,960	1,998,212
Mass., New York	624,141	665,928	1,053,257	1,415,755	2,220,522
Md., Va., West Va., Ky., Tenn.	680,774	1,143,600	1,318,964	1,781,171	2,102,106
Minn., Iowa, Col., Utah	147,562	161,000	226,808	269,686	500,862
Total	8,549,664	13,000,719	15,676,889	20,780,760	30,216,547
FERRO-ALLOYS:					
Pennsylvania	85,194	163,798	164,776	219,947	330,463
New York, N. J.	85,875	98,857	140,711	195,281	243,176
Ohio, Ill., Ia., Col.	41,510	63,386	116,402	113,147	164,173
Va., West Va., Ala., Tenn.	19,210	18,842	39,795	63,564	74,828
Total	231,789	344,883	461,684	591,939	812,640
Grand total	8,781,453	13,345,602	16,138,573	21,372,699	31,029,187

PIG IRON MADE FOR SALE IN 1936

States	Basic	Bess. & low-phos.	Foundry	Malleable	Forge	All other	Total
Mass., N. Y.	242,999	67,913	387,721	321,611	1,451	.....	1,021,695
Pennsylvania	540,801	278,778	161,878	81,872	32,220	.....	1,095,549
Md., W. Va., Ky., Ala., Tenn.	174,494	7,216	897,554	.....	.....	34,017	1,113,281
Ohio	241,110	12,662	163,299	612,721	.....	.....	1,029,792
Indiana, Ill.	215,205	10,251	49,432	413,221	.....	.....	688,109
Mich., Minn., Ia., Col., Utah	2,206	.....	104,430	73,560	.....	5,177	185,373
Total	1,416,815	376,820	1,764,314	1,502,985	33,671	39,194	5,133,799

HALF-YEARLY PRODUCTION OF PIG IRON AND FERRO-ALLOYS

States	Blast furnaces (a)				Production		
	In blast June 30, 1936	Dec. 31, 1936 In	Out	Total	First 6 months 1936	Second 6 months 1936	Total 1936
Mass.	1	0	1	1	932,244	1,288,278	2,220,522
New York	11	13	5	18			
Penna.	41	53	19	72	3,752,592	5,350,283	9,102,875
Maryland	4	5	1	6			
West Va.	3	3	0	3	965,692	1,136,414	2,102,106
Kentucky	1	1	1	2			
Tennessee	1	1	2	3			
Alabama	9	15	5	20	995,852	1,002,360	1,998,212
Ohio	30	36	12	48	3,227,197	3,979,458	7,206,655
Illinois	13	13	10	23	1,350,995	1,566,021	2,917,016
Indiana	12	15	3	18	1,890,895	2,277,404	4,168,299
Michigan	6	7	0	7			
Minnesota	1	2	0	2			
Iowa	0	0	0	0			
Missouri	0	0	1	1	252,318	248,544	500,862
Colorado	1	2	1	3			
Utah	1	1	0	1			
TOTALS:							
Pig iron	*135	*167	* 61	*228	13,367,785	16,848,762	30,216,547
Ferro-alloys	11	9	10	† 19	‡ 384,347	‡ 428,293	‡ 812,640
Grand total	146	176	71	247	13,752,132	17,277,055	31,029,187

(a) Completed and rebuilding pig iron furnaces. *Furnaces making pig iron regularly. Furnaces making ferro-alloys regularly not included. †Blast furnaces only. *Electric furnaces not included. ‡Includes ferro-alloys made in electric furnaces.

HALF-YEARLY PRODUCTION OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS

BASIC PIG IRON

States	First 6 months 1936	Second 6 months 1936	Total 1936
Massachusetts, New York	548,802	778,233	1,327,035
Pennsylvania	2,541,602	3,622,155	6,163,757
Maryland, West Virginia, Ky., Ala.	1,317,577	1,388,243	2,705,820
Ohio	1,991,322	2,393,477	4,384,799
Indiana, Illinois	2,142,227	2,634,767	4,776,994
Michigan, Minnesota, Colorado, Utah	526,071	592,445	1,118,516
Total	9,067,601	11,409,320	20,476,921

BESSEMER AND LOW-PHOSPHORUS PIG IRON

Pennsylvania	1,043,471	1,577,544	2,621,015
New York, Md., West Va., Ala.	255,096	313,506	568,602
Ohio	807,768	1,130,081	1,937,849
Indiana, Illinois	341,913	407,383	749,296
Total	2,448,248	3,428,514	5,876,762

FOUNDRY PIG IRON

Massachusetts, New York	277,017	327,917	604,934
Pennsylvania			
Maryland, Ky., Tenn., Ala.	441,111	500,767	941,878
Ohio	73,174	92,762	165,936
Illinois, Michigan, Minn., Col., Utah	175,067	143,176	318,243
Total	966,369	1,064,622	2,030,991

MALLEABLE PIG IRON

Massachusetts, New York	180,618	226,412	407,030
Pennsylvania			
Ohio	348,874	356,540	705,414
Indiana, Illinois, Minnesota	299,533	305,080	604,613
Total	829,025	888,032	1,717,057

FERRO-ALLOYS BY KINDS

Ferro-manganese and spiegeleisen	177,284	217,835	395,119
Ferro-silicon	178,847	181,643	360,490
Other ferro-alloys	28,216	28,815	57,031
Total	384,347	428,293	812,640

PRODUCTION OF PIG IRON AND FERRO-ALLOYS IN 1936

(For sale and for maker's use)

	For sale	For maker's use	Total
PIG IRON:			
Basic	1,416,815	19,060,106	20,476,921
Bessemer and low-phosphorus	376,820	5,499,942	5,876,762
Foundry	1,764,314	266,677	2,030,991
Malleable	1,502,985	214,072	1,717,057
Forge or mill	33,671	.....	33,671
White and mottled, direct castings, etc.	39,194	41,951	81,145
Total	5,133,799	25,082,748	30,216,547
FERRO-ALLOYS:			
Ferro-manganese and spiegel	143,247	251,872	395,119
Ferro-silicon	352,175	8,315	360,490
Other ferro-alloys	56,686	345	57,031
Total	552,108	260,532	812,640
Grand total	5,685,907	25,343,280	31,029,187

. . . CLEVELAND . . .

. . . Steel plant operations hard pushed to get out heavy backlogs.

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. . . Mills filled on sheets for second quarter; other products one to two months.

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. . . Two new Lake freighters awarded; will require 12,000 tons of steel.

CLEVELAND, March 30. — Steel plant operations are still being crowded to turn out the tonnage covered by first quarter contracts and to eat into the heavy backlogs of second quarter business. Ingot output in the Youngstown district is unchanged this week at 88 per cent of capacity. In the Cleveland - Lorain district two open hearths have been shut down for repairs, reducing the ingot output four points to 78 per cent.

March will show new high production records by some of the mills. Producers will start the second quarter with their lower priced tonnage in finished steel nearly all shipped and with enough business on their books to carry them to about the middle of the quarter on some products and nearly to July 1 on others. Mills are either fully or nearly sold up for the quarter on sheets, cold rolled strip, wire products, billets and wire rods. Bar orders can be placed for delivery four to eight weeks, structural shapes in four to five weeks, plates in eight weeks and hot rolled strip in six to eight weeks.

The volume of new business continues heavy and there is considerable pressure for deliveries of sheets and strip steel. Large tonnages are being taken by the automobile companies except Chrysler and Hudson, whose shipments are still suspended because of strikes. Yielding to pressure by consumers anxious to get tonnage in flat rolled steel on the mill books, several mills that had stopped taking business because their order books were so well filled for the second quarter are again entering orders subject to prices prevailing at time of shipment. Such orders usually cannot be filled before July.

Interest is already being taken in third quarter prices and some belief is expressed that there will be no changes except possibly minor revisions on some products.

Bars, Plates and Shapes

Bars continue in heavy demand and deliveries are more extended. Agricultural implement manufacturers are taking good tonnages. Activity in the construction field has declined since the price advance. Fort Pitt Bridge Works Co. has taken 800 tons for a slab crane runway for the Republic Steel Corp. in Cleveland. Fabricators will not be allowed to overspecify on contracts for steel for identified projects under a new policy adopted by mills. With a deadline date of March 31 for specifications against contracts placed in January, considerable tonnage of structural shapes is reaching the mills. Fabricators have until April 30 to specify against contracts placed in February and March. Carnegie-Illinois Steel Corp. has received specifications for 6000 tons of plates and shapes for two boats to be built for the Pittsburgh Steamship Co. at the Lorain yards of the American Shipbuilding Co. and an additional 6000 tons is to be specified in April.

Fluorspar

Some producers have advanced domestic fluorspar $1 a ton for rail shipment and $1.50 a ton for barge shipment, and others indicate that they probably will fall in line with higher quotations.

Pig Iron

Shipments by some producers during March will be the heaviest of any month for several years because foundries, with scarcely an exception, are taking out all the low-priced iron covered by their first quarter contracts. Some consumers are not in immediate need of all the iron they have bought, but are putting it in stock to effect a saving. Sales have tapered as most consumers have covered for the second quarter. Buying has not been as heavy as for the first quarter because foundries did not have the incentive to place tonnage that they had in December, when they got under cover before the Jan. 1 price advance. Some producers are not pushing sales of either Northern or Southern iron, as their books are well filled for the coming quarter. Shipments with some producers are heavier than production and some furnaces will have to carry over iron for early April shipment. Considerable iron is still being held up by foundries making castings for Chrysler and Hudson automobiles and these probably will be allowed to take their iron later at the first quarter contract price.

Sheets

New demand continues heavy, with deliveries by some mills becoming more extended. Most producers have about all the tonnage on their books they can get out in the second quarter. One leading producer is now promising deliveries up to 20 to 23 weeks on hot-rolled sheets, 22 weeks on hot-rolled annealed, 13 weeks on vitreous enameling and 11 to 12 weeks on cold reduced sheets and 9 to 12 weeks on tin mill back plate. Some mills that have been out of the market recently because they had orders for all the sheets they could produce during the second quarter are now accepting some business for the third quarter subject to prices prevailing at time of shipment.

Strip Steel

Considerable new business in hot and cold strip was placed by General Motors parts plants the past week for delivery as soon as the mills can ship, which in the case of some producers will not be until in June. Others are promising six to eight weeks' delivery on hot strip. Pressure for deliveries is coming from some of the automotive plants. Miscellaneous demand is quite active and it seems probable that all the mills soon will be entirely filled up for the second quarter.

Roller-Smith Co., New York, has appointed Spring & Buckley, Inc., 77 Church Street, New Britain, Conn., as its agent in that State.

...Pig iron sales held down by furnaces.

BOSTON, March 30.—March winds up with the pig iron situation quite tight, and the future policy of furnaces rather uncertain. The past week's sales at 1200 tons were limited by sellers' reluctance to commit themselves. Arrangements have been completed for vessels to load 35,000 tons of Mystic pig iron recently sold to Japan. Initial shipments will aggregate some 10,000 tons to be loaded at Mystic docks, Charlestown, across the river from the Mystic Iron Works. The 35,000 tons is a part of 100,000 tons of iron purchased this year by Japan in the United States.

...Large volume of steel orders placed.

o o o

...Structural market is more active.

SAN FRANCISCO, March 29.—A large volume of orders, most of them under 100 tons, during the past two weeks have kept mills booked far in advance on all forms of steel. Mills can operate at capacity until August on present orders for certain types of steel, while shipments from the East are far behind the demand. Particularly active last week was the structural steel market, which only a short time ago was sluggish and inactive. In spite of this increase in business, orders placed so far during 1937 do not approach the volume of those at this time last year, due largely to the recent dock tie-up. A one-day dock shut-down last week was a brief worry to steel companies, but difficulties were ironed out with little trouble.

An award of 6000 tons of structural steel called for in the construction of a shop building for the Government air depot at Sacramento, Cal., to Bethlehem Steel Co. led an aggregate of 7432 tons of shape lettings for the week. Eaton & Smith were low bidders on the general contract for supply buildings for the same air depot. This second project involves 1500 tons of shapes and 500 tons of reinforcing steel. The reinforcing market was limited to small tonnages.

U. S. Pipe & Foundry Co. was awarded a total of 1345 tons of cast iron pipe during the week, of which 615 will be used in a Pasadena, Cal., water system. National Cast Iron Pipe Co. took 385 tons of 8-in. for this project. Total lettings for the week were 2750 tons.

Navy Awards More Steel For Ships

WASHINGTON, March 30.—The Navy Department has announced additional awards of steel, including 6283 tons at a total cost of $627,956 for destroyers. Of the total, 5228 tons went to the Carnegie-Illinois Steel Corp. Most of the tonnage was awarded by drawing lots. The tonnage was distributed as follows:

Carnegie-Illinois Steel Corp., 759 tons high tensile plates, sheets and strips, $122,607; 330,000 medium plates, $317,229.50; 737 tons high tensile shapes, $51,412.50 and 366 tons of steel bars and strips, $24,748.

Bethlehem Steel Co., 120 tons of plates, $7,624.

Alan Wood Steel Co., 210 tons of plates, $25,025.

Penn Galvanizing Co., Philadelphia, 26 tons galvanized plates, $1,661.

Enterprise Galvanizing Co., Philadelphia, 669 tons high tensile shapes, $79,649.

The Navy Department also awarded 719 tons of shapes for stock, 452 tons for the East Coast yards going to the Carnegie-Illinois Steel Corp. and 267 tons for the West Coast yards going to the Bethlehem Steel Co. The Bethlehem company also was awarded 75 tons of tees for submarines.

J. & L. 1936 Earnings $4,129,660

JONES & LAUGHLIN STEEL CORP. reports net earnings for 1936 of $4,129,660, compared with a net loss of $398,716 in 1935. The rate of operations for the year 1936 averaged 65 per cent of the steel ingot capacity of the corporation, compared with 44 per cent for the previous year. Total taxes for 1936 amounted to $3,945,259, compared with $2,800,493 for the previous year.

Average number of employees in 1936 totaled 29,272, compared with 24,244 for the previous year.

...Raw material shortage closes one steel plant.

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...Mills reluctant to take more forward business.

LONDON, March 30 (By Cable).—The demand for iron and steel was unaffected by the holidays and production was uninterrupted. However, new business is small as makers are fully booked for months ahead and are reluctant to accept far forward business owing to the uncertainty of raw material and the imminence of price revisions. Numerous additional blast furnaces are starting up shortly, but their output is required for contracts already booked. Steel works are operating at full capacity, but are still behind the demand. Semi-finished steel is especially scarce and rationing may be introduced.

Lanarkshire Steel Works, Flemington, including three furnaces, two section mills and a plate mill, are closed owing to raw material shortage. Two thousand workers of the Parkhead Forge of William Beardmore, Glasgow, are striking for higher wages and important armament work is delayed.

Owing to increased costs some railway building plans may be modified or abandoned.

Although official prices on tin plate remain unchanged, selling prices continue to advance and, while the demand is good, many makers are unwilling to quote owing to steel position and rising costs.

The demand for Continental iron and steel is strong but only a small tonnage is released for export.

Alan Wood Elects New Officers

AT a recent meeting of the board of directors of the Alan Wood Steel Co., W. F. Rust resigned as chairman of the board, and president, and C. B. Wood, a director, was elected to these two positions. To fill Mr. Wood's place on the board, and that of J. T. Tierney, who resigned, Alan Wood, III, and J. T. Whiting, vice-president, were elected.

. . . . NEW YORK. . . .

. . . Steel mills are virtually rationing steel and only to regular customers.

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. . . All orders and inquiries are being carefully scrutinized.

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. . . Tin plate demand heavy; some mills sold up until October.

NEW YORK, March 30.—As the first quarter of 1937 comes to a close, one of the strangest chapters in steel trade history is being written. Each week confirms what has been said before, that nothing quite like the present period has ever been experienced. There was allocation of steel and pig iron during the World War, but the allocating was done under the direction of the War Industries Board; today the steel companies are doing their own rationing of available supplies in order to take care of their regular trade as best they can and to prevent the accumulation of speculative stocks by one customer to the detriment of another who needs the same material. There was an enormous piling up of steel business in 1920, but steel people do not recall that they were obliged to turn down as much tonnage then as they are declining now. Nor was there even in 1929 any situation just like the one existing at present.

The functions of sales offices in this district have completely changed from the job of selling steel to that of ironing out problems. These problems have mostly to do with placating customers who are not getting enough steel or who would like to get orders on the books as a protection against possible future shortage or further price advances. Several steel companies are scrutinizing every order and inquiry in an effort to prevent loading up their books with business they do not want. A buyer who tries to shop around finds that steel companies from which he has not been buying in the past year turn down his profferred order without ceremony; even those companies from which he has been buying regularly will not permit him to order more than his usual requirements, based upon what he took last year.

There is no evidence that any manufacturing plant has been obliged to shut down or even to curtail operations because of lack of steel, but many buyers plead with steel companies for more tonnage as if such a thing might happen if the order were not accepted.

One of the tightest situations is in tin plate. Can companies, whose contracts run on a nine-months' basis, from Jan. 1 to Oct. 1, will take all of the tin plate that their suppliers can produce. Not only do they expect the heaviest demand in years for cans, but they also are aware of the probability of a substantial tin plate price advance by Oct. 1, if not before. Some tin plate makers appear to be in favor of an almost immediate price advance on tin plate, even though it would affect little of the tonnage to be shipped between now and Oct. 1. Some makers have already booked all of the tonnage they can produce by that date, while others cannot promise shipments before August or September on new orders.

The New York Central opened bids today (Tuesday) on its second quarter steel requirements.

Pig Iron

Although a tight supply situation exists, consumers are mostly covered for second quarter and there is no excess demand at present. Producers are selling in small quantities to regular customers who purchase for prompt shipment, and continue to accept occasional foreign orders which can be filled from miscellaneous yard stocks. Shipments are heavy. Most foundries appear to be busy, although in the adjoining Connecticut area establishments which manufacture machine tools for the automobile industry have curtailed slightly due to strikes affecting that industry. Unless price consciousness again motivates buyers, no large demand for pig iron should reappear until producers open books for the third quarter. The undertone respecting prices is strong, but necessity for action not yet pressing.

Plates and Sheets

Domestic demand seems to have slowed slightly in the past week, but there has been no let up in foreign interest. It appears now that more plates were sold for shipment abroad a few weeks ago than was believed at that time. Now come reports of large tonnages of plates, all one size and at premiums, being rejected by mills. The reasons, almost without exception, are because makers desire to hold themselves in the best possible position to take care of their regular trade here. Sheet business has attained such proportions that one large mill is now on a quota basis, with each sales office being allowed a certain tonnage monthly, and no more.

Reinforcing Steel

Business coming in at the new price has still not been in sufficient volume to determine the stability of the market. Several jobs that obtain first quarter prices have been closed, and others are expected to be cleared from the books shortly. Concrete Steel Co. was awarded 700 tons of bars for a Universal Atlas Cement Co. plant in Hudson, N. Y.; Bethlehem received between 400 and 500 tons of bars for a Congoleum-Nairn plant at Marcus Hook, Pa., and Carroll-McCreary Co. will furnish 155 tons for a section of the West Side elevated highway between 185th and 191st Streets. Still pending is some tonnage for the Sixth Avenue subway, an armory at West Point and a hospital on Welfare Island.

Blast Furnace Has Run Since 1930

THE No. 10 blast furnace of the Carnegie-Illinois Steel Corp., Gary works, was blown in on May 8, 1930, and has been in continuous service on one lining since that time. During this period it has produced 2,000,000 tons of iron. In July, 1931, it established a record of 1201.1 tons per day for the month.

Bill to License Scrap Exports Introduced in U. S. Senate

WASHINGTON, March 30.—Senator Lewis B. Schwellenbach of Washington today introduced a bill to license exports of iron and steel scrap. The measure is like the bill under which exportations of tin plate scrap may be made only upon license by the National Munitions Control Board, of which Secretary of State Hull is chairman. The Schwellenbach bill therefore would provide for a quota system for exporting all kinds of scrap iron and steel.

Heavy exportations of scrap, together with high prices, have been for a considerable time a source of agitation for control of shipments abroad. In some quarters in Washington, concern has been shown over the outward movement of scrap on the ground that it is being used for purposes of armament. Some important units in the steel industry, also some foundries, have complained that exports of scrap have resulted in difficulty in getting supplies as well as raising price levels considerably and thus increasing cost of producing steel and lifting prices of the rolled products.

The Schwellenbach bill has been referred to the Senate Committee on Military Affairs. Labeled a bill for the preservation of scrap steel, it is offered as a measure to conserve steel scrap as a matter of national defense and, if enacted into law, its administration in all probability would be under the jurisdiction of the National Munitions Control Board rather than under the jurisdiction of the Department of Commerce.

Senator Schwellenbach has made no arrangements for hearings on the bill and whether or not it will pass remains to be seen. It is reported there is considerable administration opposition to such proposed legislation and if this is true it is likely it would fail of passage.

. . . Awards of 1685 tons —4210 tons in new projects.

AWARDS

Hudson, N. Y., 700 tons, Universal Atlas Cement Co., to Concrete Steel Co.

Marcus Hook, Pa., 450 tons, Congoleum-Nairn Co. plant to Bethlehem Steel Co.

New York, 150 tons, West Side elevated highway, 185th to 191st Streets, to Carroll-McCreary & Co., Inc.

Cambridge, Mass., 250 tons, fertilizer building, to Morrison-Stevens Co.

Medford, Mass., 165 tons, metropolitan relief sewer to Morrison-Stevens Co.

Peoria, Ill., 250 tons, court house, to Concrete Engineering Co.

State of Illinois, 200 tons, paving, to Concrete Engineering Co.

Denver, 100 tons, bridge and approaches, to an unnamed bidder.

Phoenix, Ariz., 380 tons, Salt River reclamation project, 220 tons, to Colorado Fuel & Iron Co., 160 tons to Concrete Engineering Co.

Fort Sumner, N. M., 338 tons, Parker dam project, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

Hartford, Vt., 100 tons, Veterans' Hospital.

Pittsburgh, 250 tons, Union Supply Co. warehouses; bids soon.

Milwaukee, 600 tons, rail steel for grain elevator; bids soon.

Fond du Lac, Wis., 250 tons, building for Holy Name Monastery.

Chicago, 400 tons, building for A. B. Dick Co.

Riverdale, Ill., 800 tons, buildings for Acme Steel Co.

Chicago, 1500 tons, Kraft-Phoenix Cheese Co. building.

Denver, 157 tons, All American Canal project; bids opened.

Fullerton, Cal., 150 tons, junior college building; bids opened.

British Steel Man Sees Long Prosperity

LONDON *(Special Correspondence).*—"The prosperity of the British steel trade is due to the abandonment of the gold standard and the introduction of tariffs," declared Allan J. Grant, managing director of Thomas Firth & John Brown, Ltd., in a speech at Sheffield.

"Though the demand for steel exceeds the supply, I am doubtful whether the excess is as great as figures show. The question uppermost in our minds is: How long will the period of good trade last? I see no reason why it should not continue for many years.

"Active steps are being taken by all steel makers organized by the Iron and Steel Federation to see there is no big unjustified and uncontrolled rise in prices.

"For the first time in the industrial history of Britain the steel industry is trying to control prices and only allow increases which are justified by increases in costs. It is a complicated business, but satisfactory progress is being made. It is entirely untrue that the present prosperity is largely due to the new defense program."

British Steel Output At New High Level

LONDON *(Special Correspondence).*—British steel production during February, measured by the daily average, reached a new high record level. For the 22 working days the average was 45,268 tons, compared with 42,506 tons in January, 41,711 tons in February last year, and 43,535 tons in November, the previous high record.

Production of steel ingots and castings in February amounted to 995,900 tons, against 998,900 tons in January and 938,500 tons in February, 1936.

Pig iron output in February amounted to 603,700 tons, compared with 650,700 tons in January and 584,700 tons in February, 1936. The reduced output was due entirely to the smaller number of working days.

Steel Engineers To Meet April 28-29

THE Association of Iron and Steel Engineers will hold its annual spring conference in Buffalo on April 28 and 29, with headquarters at the Statler Hotel. This yearly meeting is expected to attract over 1000 steel mill engineers and operators to Buffalo. The sessions will convene at 8 o'clock Wednesday evening, April 28.

Among the technical papers to be presented are: "Radiant Tube Annealing Covers"; "Electrical and Mechanical Developments of Modern Cold Roll Strip Mills"; "Some Heating Furnace Control Problems"; "Diesel's Electric Locomotives for Switching Purposes"; and "Simplicity of Stress Distribution in Arc Welded Joints." Thursday afternoon, April 29, the members will inspect the new continuous hot and cold strip mills of the Bethlehem Steel Co. at Lackawanna.

FABRICATED STEEL

. . . Lettings in good volume at 35,550 tons compared with 18,900 tons last week.

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. . . New projects slightly higher at 24,900 tons as against 23,870 tons a week ago.

NORTH ATLANTIC STATES

Yarmouth, Me., 120 tons, State bridge, to American Bridge Co.

New York, 1370 tons, Washington Irving high school, to Lehigh Structural Steel Co., Allentown, Pa.

New York, 980 tons, public school No. 162, to Lehigh Structural Steel Co.

New York, 3350 tons, addition to Federal office building, to Karl Koch Erecting Co.

New York, 100 tons, building alteration at 120-30 East 34th Street, to Dreier Structural Steel Co.

New York, 2325 tons, sanitation garage at 56th Street and 12th Avenue, to Bethlehem Steel Co.

New York, 300 tons, shaft for Midtown tunnel, to American Bridge Co.

Brooklyn, 470 tons, public school No. 254, to Lehigh Structural Steel Co.

Silver Creek, N. Y., 995 tons, bridge, to Mount Vernon Bridge Co., Mount Vernon, Ohio.

Niagara Falls, N. Y., 155 tons, Public Service building, to R. S. McManus Steel Construction Co., Buffalo.

Ovid, N. Y., 185 tons, Central school, to F. L. Heughes & Co., Rochester, N. Y.

Williamsville, N. Y., 100 tons, County bridge, to R. S. McManus Steel Construction Co.

Delaware County, N. Y., 270 tons, bridge, to Jones & Laughlin Steel Corp.

Albany, N. Y., 670 tons, extension to factory building, Albany Felt Co., to Bethlehem Steel Co.

Massena, N. Y., 850 tons, buildings for Aluminum Co. of America, to Bethlehem Steel Co.

Mendon, N. Y., 230 tons, highway bridge for Lehigh Valley Railroad, to Phoenix Bridge Co., Phoenixville, Pa.

Camden, N. J., 310 tons, addition to can cooling building and conveyer bridge, Campbell Soup Co., to Belmont Iron Works, Philadelphia, Pa.

Camden, N. J., 330 tons, school addition, to Bethlehem Fabricators Inc., Bethlehem, Pa.

Trenton, N. J., 100 tons, Pennsylvania Railroad station alteration, to Keystone Structural Steel Co.

Hillside, N. J., 150 tons, warehouse for Chicago Bridge & Iron Works, to American Bridge Co.

New Brunswick N. J., 195 tons, building for E. R. Squibb & Sons, to H. R. Goeller.

Mayview, Pa., 280 tons, mental patients building, to Levinson Steel Co., Pittsburgh.

Pittsburgh, 1525 tons, storage building, to American Bridge Co.

Lycoming County, Pa., 275 tons, Larry's Creek bridge, to American Bridge Co.

Baltimore, 2500 tons, factory for Glenn L. Martin Co. to Bethlehem Steel Co.

Baltimore, 350 tons, mill building, Rustless Iron & Steel Co., to American Bridge Co.

Point of Rocks, Md., 1600 tons, Potomac River State bridge, to American Bridge Co.

Washington, 450 tons, Chesapeake & Potomac Telephone Co. building, to Barber & Ross, Washington.

THE SOUTH

Elm City, N. C., 220 tons, highway bridge, to Southern Engineering Co.

Alcoa, Tenn., 250 tons hoist support and electrode bus frames, Aluminum Co. of America, to Chattanooga Tank & Boiler Co.

Ada, Okla., 155 tons, hospital building, to Capitol Steel & Iron Co., Oklahoma City.

CENTRAL STATES

Cleveland, 150 tons, Aquacade for Cleveland exposition, to Kilroy Structural Steel Co.

Cleveland, 800 tons, slab crane runway for Corrigan, McKinney plant of Republic Steel Corp., to Fort Pitt Bridge Works Co.

Middletown, Ohio, 155 tons, Shartle Brothers shop, to Oregonia Bridge Co., Lebanon, Ohio.

Cincinnati, 175 tons, Hudepohl stock house, to R. C. Mahon Co., Detroit.

Kalamazoo, Mich., 270 tons, warehouse for Upjohn Co., to Mississippi Valley Structural Steel Co.

Detroit, 230 tons, alterations to Hotel Statler, to R. C. Mahon Co.

Detroit, 1450 tons, service building for Detroit Eidson Co., to R. C. Mahon Co.

Lansing, Mich., 560 tons, storage building for Olds Motor Works, to R. C. Mahon Co.

Milwaukee Road, 165 tons, bridge repairs in Minnesota, to Duffin Iron Works.

Chicago, 610 tons, factory building, to Joseph T. Ryerson & Son Co., Inc.

Chicago, 2600 tons, sanitary district, to Bethlehem Steel Co.

Chicago, 400 tons, Benson & Rixon store, to American Bridge Co.

WESTERN STATES

Larimer County, Colo., 240 tons, highway bridge, to Midwest Steel & Iron Works, Pueblo, Colo.

Cheyenne and Lincoln Counties, Colo., 275 tons, bridge, to Midwest Steel & Iron Works.

Sacramento, Cal., 6000 tons, shop building, Government air depot, to Bethlehem Steel Co.

San Jose, Cal., 160 tons, apartment building, to Golden Gate Iron Works, San Francisco.

Davis, Cal., 150 tons, gymnasium for College of Agriculture, to Herrick Iron Works.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Rumford-Mexico, Me., 425 tons, State bridge.

Bridgeport, Conn., 1500 tons, mill and office building, Bridgeport Brass Co.

New York, 200 tons, ventilation building, Vehicular Tunnel, Port of New York Authority.

New York, 250 tons, alterations to Bellevue Hospital power plant.

New York, 1200 tons, public school No. 117 in Bronx.

Syracuse, N. Y., 700 tons, Solvay Process Co. manufacturing and office building.

Ithaca, N. Y., 100 tons, bridge RC-3865.

Buffalo, 5000 tons, Chevrolet Motor Co. motor and axle plant; Albert Kahn, Inc., Detroit, architect.

Juniata County, Pa., 1350 tons, State highway bridge.

Lycoming County, Pa., 440 tons, State highway bridge.

Westmoreland and Indiana Counties, Pa., 850 tons, two bridges; bids April 9.

McKean County, Pa., 175 tons, bridge; bids April 9.

Clearfield County, Pa., 480 tons, bridge; bids April 9.

Cameron County, Pa., 400 tons, bridge; bids April 9.

Washington, 200 tons, store building addition, F. R. Jelleff.

THE SOUTH

Norfolk, Va., 850 tons, addition to assembly plant, Ford Motor Co.; Albert Kahn, Inc., Detroit, architect.

Louisville, Ky., 300 tons, warehouse, Brown & Williamson Tobacco Co.

Malvado, Tex., 230 tons, Meyer's Canon bridge for Southern Pacific Co.

Houston, Tex., 1000 tons, derricks for Sinclair Refining Co.

Miami, Fla., 1500 tons, bridge.

CENTRAL STATES

Cleveland, 700 tons, bridges over Discharge Channel for Treasury Department.

Akron, Ohio, 500 tons, South Main Street grade crossing bridge; new bids asked.

Dayton, Ohio, 500 tons, building for Moraine Product Co.

Detroit, 700 tons, engine plant and laboratory for General Motors Co.; Albert Kahn, architect.

Dearborn, Mich., 2600 tons, alterations to transfer building, Ford Motor Co.

State of Illinois, 310 tons, four highway bridges; bids April 2.

WESTERN STATES

Sacramento, Cal., 1500 tons, supply buildings for Government air depot; Eaton & Smith, low bidders on general contract.

Los Angeles, 445 tons, Roosevelt highway bridge; bids April 5.

Tacoma, Wash., 380 tons, River Street viaduct.

FABRICATED PLATES

AWARDS

Baltimore, 130 tons, tank for Petroleum Heat & Power Co., to Chicago Bridge & Iron Works, Chicago.

Heath, Ohio, 140 tons, two oil heaters, to Pittsburgh Bridge & Iron Works.

Cleveland, 12,000 tons, two ore boats for Pittsburgh Steamship Co. to American Ship Building Co.; plates to be furnished by Carnegie-Illinois Steel Corp.

SHEET PILING

AWARDS

Charleston, S. C., 275 tons, Treasury Department Procurement Division, to Jones & Laughlin Steel Corp.

NEW PROJECTS

Holtville, Cal., 300 tons, invitation A-42209-A and A-42216-A for All American Canal.

. . .NON-FERROUS. . .

. . . *Easter holidays interrupt trading in metals.*

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. . . *Domestic copper sales 42,000 tons in March.*

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. . . *Lead and zinc quiet; tin inactive.*

NEW YORK, March 30. — Metals here were generally quiet and unchanged during the week, as buyers awaited reopening of the London market following the Easter holidays. Domestic copper prices held unchanged and firm at 16.25c., Connecticut Valley, as based on producers' price for electrolytic. Demand was quiet, sales yesterday having been about average at between 800 and 900 tons, and the month's total having advanced to around 42,100 tons. With London reopening this morning, the price there advanced to approximately 17.45c. for electrolytic, c. i. f., Europe, but worked lower on second session. Trading was moderate, and little change in sentiment developed on this side.

The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 24	Mar. 25	Mar. 26	Mar. 27	Mar. 29	Mar. 30
Electrolytic copper, Conn.*	16.25	16.25	16.25	16.25	16.25	16.25
Lake copper, N. Y.	16.37½	16.37½	16.37½	16.37½	16.37½	16.37½
Straits tin, spot, New York	65.50	66.00	....	....	66.00	†65.25
Zinc, East St. Louis	7.50	7.50	7.50	7.50	7.50	7.50
Zinc, New York	7.85	7.85	7.85	7.85	7.85	7.85
Lead, St. Louis	6.80	6.80	6.80	6.80	6.80	6.80
Lead, New York	6.95	6.95	6.95	6.95	6.95	6.95

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Noon Price.

Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb. delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 17.00c. a lb., New York.
Quicksilver, $91.00 to $93.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 16.75c. a lb. delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse
Delivered Prices, Base per Lb.

Tin, Straits pig	65.00c. to 66.00c.
Tin, bar	67.00c. to 68.00c.
Copper, Lake	17.25c. to 18.25c.
Copper, electrolytic	17.25c. to 18.25c.
Copper, castings	17.25c. to 18.25c.
*Copper sheets, hot-rolled	23.87½c.
*High brass sheets	21.25c.
*Seamless brass tubes	24.00c.
*Seamless copper tubes	24.62½c.
*Brass rods	17.62½c.
Zinc, slabs	7.75c. to 8.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	12.75c.
Lead, American pig	7.75c. to 8.75c.
Lead, bar	8.75c. to 9.75c.
Lead, sheets, cut	10.50c.
Antimony, Asiatic	18.00c. to 19.00c.
Alum., virgin, 99 per cent plus	24.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	40.00c. to 42.00c.
Babbitt metal, commercial grades	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 33⅓ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse
Delivered Prices per Lb.

Tin, Straits pig	70.00c.
Tin, bar	72.00c.
Copper, Lake	17.00c. to 17.25c.
Copper, electrolytic	17.00c. to 17.25c.
Copper, castings	16.75c. to 17.00c.
Zinc, slabs	8.75c. to 9.00c.
Lead, American pig	7.50c. to 7.75c.
Lead, bar	11.00c.
Antimony, Asiatic	18.75c.
Babbitt metal, medium grade	27.50c.
Babbitt metal, high grade	74.00c.
Solder, ½ and ½	42.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	13.37½c.	14.12½c.
Copper, hvy. and wire	13.25c.	13.75c.
Copper, light and bottoms	12.25c.	12.50c.
Brass, heavy	8.25c.	8.87½c.
Brass, light	6.50c.	7.25c.
Hvy. machine composition	11.75c.	12.25c.
No. 1 yel. brass turnings	8.62½c.	9.12½c.
No. 1 red brass or compos. turnings	11.12½c.	11.62½c.
Lead, heavy	6.00c.	6.37½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.
Zinc	4.25c.	4.62½c.

Lead

Demand continued quiet during the week, although all but one large producer opened books for May delivery orders. Prices held unchanged at 6.80c., St. Louis, the contract settling basis of the American Smelting & Refining Co., and 6.85c., St. Louis, the price quoted by St. Joseph Lead Co. On Eastern sales, the latter producer's quotation is at a $2 premium over the Smelting Co.'s base price. Sellers point out that the Easter cessation of trading in London was partially responsible for lack of interest by consumers here.

Zinc

Sales of ordinary grade metal totaled approximately 2400 tons last week, and shipments were between 5000 and 6000 tons. There was no change in the price, which continued firm at 7.50c., East St. Louis. With steel mills unusually active, sellers point out that galvanizers are attempting to anticipate shipments of zinc, but that releases are not heavier because of tight supplies.

Tin

The prolonged Easter holiday in London affected trading here adversely, and the market was largely devoid of turnover last week. Nominally spot Straits metal at New York was quoted at 66c. a lb. yesterday, while at noon today the price appeared to be about 65.25c. In London this morning, standards sold for £293 10s. spot and £288 5s. futures. The Eastern price was £287 15s.

Ingot Brass and Bronze

Average prices received by members of the Non-Ferrous Ingot Metal Institute during the 28 days ended March 19 on commercial 80-10-10 and commercial 85-5-5-5 brass ingots were 18.588c. a lb. and 16.409c. respectively. Preceding prices were 15.965c. and 13.320c. Deliveries of brass and bronze ingots and billets by the members totaled 9433 tons in February, against 10,022 tons in January. Unfilled orders amounted to 30,286 tons on March 1, against 29,309 tons on Feb. 1.

IRON AND STEEL SCRAP

. . . Additional strength at Chicago forces composite up to $21.92.

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. . . Supplies are moving more freely in all districts.

MARKETS all over the country appear to be marking time. Consumers are not buying heavily, and brokers report that in general supplies are moving very freely at present price levels. The current quiet spell was to be expected in view of the steady upward march in quotations since late November, 1935, at which time the average figure for heavy melting steel was at $16.17. The current composite figure is $21.92, up 17c. from a week ago due to a 50c. advance in the Chicago area. Chicago continues to report a moderately bullish undertone, and at Pittsburgh sellers deny that there is any weakness. Eastern Pennsylvania is quiet, and most other markets intimate that prices appear to be leveling off, with the possibility that a more liberal turnover in supplies may soon be reflected in lower quotations. Exporters are still more concerned with trying to secure boats to get rid of present accumulations than with the buying of additional material. Any trend in the latter direction is still being discouraged by the hesitancy of railroads to release cars for deliveries to export ports.

Pittsburgh

This market is marking time but still retains a strong undertone. No representative sales have been made within the past week, and some consumers are temporarily out of the market. Some dealers are still of the opinion that the market is softer, despite the fact that local operations are at the highest point in several years and scrap is still far from plentiful. Some dealers are freely paying $23.50 for No. 1 steel for coverage of old contracts. Factors which give the impression of weakness are evidently traceable to railroad embargoes at different points, but there is a tendency for this condition to clear up. Railroad heavy melting has been sold into consumption recently at $25 a ton.

Chicago

Heavy melting steel has moved up 50c. a ton to $22 a gross ton, delivered consumers' yards. Other grades are also moving to higher levels. There are no major signs of a halt in this market; however, country dealers report that high prices are bringing out scrap so fast that many of their yards are swamped with scrap which they do not have time and facilities to prepare.

Cleveland

The market remains firm with no change in quotations. Purchases by consumers were lacking during the week in both the Cleveland and Youngstown districts. Brokers are paying $21 or more for No. 1 steel for Cleveland delivery against their recent $21.50 orders. In the Youngstown district No. 1 is bringing $21.50 to $22 for brokers and No. 2 is bringing $21. Scrap is coming out in fair volume at the current prices. Brokers have purchased some scrap at Lake ports for water shipment to Cleveland as soon as Lake navigation opens.

Buffalo

The price of No. 2 steel has again strengthened with the purchase during the week of a considerable tonnage at either $19.75 or $20. The mill making the purchase accepted no No. 1, although its customary differential is $1. Sales of 3-ft. rails at $24 to $25 and of low phos at $24 to $25 have been reported. Another mill has bought a tonnage of No. 1 and No. 2, with at least $21 being paid for the No. 1. This latter mill generally has a $1.50 differential on No. 2.

Philadelphia

This market has quieted down. Few domestic sales of importance have been reported, and only a few changes have been made in the price list. Export prices are nominal inasmuch as the railroad embargo is still in effect. By the end of this week, it is estimated that only about 10,000 to 12,000 tons of scrap will be on cars. In spite of this clearing of the congestion at Port Richmond, the future attitude of the railroad is still in doubt, and no decision had been made at this writing as to whether the ban on further shipments will be lifted. Several scrap buyers report that material is moving fairly well. The sale of 4000 tons of hydraulically compressed bundles by the Budd Company today is expected to bring out a substantially higher price than the $18.75 f.o.b. price realized last month.

Boston

Prices for No. 2 steel, turnings and bundled skeleton are firmer on an improved demand. For shipment to the American Steel & Wire Co., Worcester, most brokers are paying $16 to $16.50 a ton for No. 2, delivered, as against $16 a week ago. A single exporter is bidding as high as $17 a ton, delivered Army base, for similar material. Ordinary steel turnings are now $9.50 to $10 a ton, f.o.b., as against $9.30 a week ago, while Youngstown, Weirton and other Pennsylvania deliveries of short turnings are $10.50 a ton, f.o.b. Bundled skeleton or busheling is $13.50 to $13.75 a ton, as against $13.40 to $13.50 a week ago.

Detroit

No price changes have been reported this week. A probable leveling off is indicated, although with no tonnages offered, there have been no sales; consequently, there is no price barometer. The effects of the Chrysler strike are still felt, but no one sees any basis for pessimism. Chevrolet has 278 cars of various classifications including 135 cars of turnings, on which bids close Wednesday. Bids on this material probably will point the price trend.

Cincinnati

Small advances in dealers' bids were made the past week, in keeping with reported prices on recent railroad lists. Material eased a bit as dealers showed a tendency to take their profit, while mill and foundry ordering became more general. Labor is being watched carefully for possible reaction on price trends.

St. Louis

With the exception of railroad specialties, which are scarce and in demand, the market here is getting congested because of the volume of dealers' scrap coming in. Everyone is awaiting developments, and they are expecting a softer market. Prices are unchanged. New railroad lists are as follows: St. Louis-San Francisco, 4500 tons; St. Louis-Southwestern, 20 carloads.

New York

An active market continues in existence here, and prices have not yet found a ceiling. Dealers are reported to be paying from $17.50 to $18 a ton for heavy melting steel loaded on cars, but their price at the docks for truck load deliveries is 50c. less. The movement of material into adjacent mill areas is considerable, and large quantities are going abroad. Demand for No. 2 steel is inferior to that for No. 1, which has caused the spread between these two quotations to increase lately. Activity in stove plate has been resumed after a temporary dullness, and prices on this grade are from $1 to $1.50 higher.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$23.50 to $24.00
Railroad hvy. mltng. ..	24.50 to 25.00
No. 2 hvy. mltng. steel.	20.00 to 20.50
No. 2 RR. wrought	23.50 to 24.00
Scrap rails	24.50 to 25.00
Rails 3 ft. and under..	26.50 to 27.00
Comp. sheet steel	23.50 to 24.00
Hand. bundled sheets.	21.00 to 21.50
Hvy. steel axle turn...	22.00 to 22.50
Machine shop turn.....	14.50 to 15.00
Short shov. turn.....	15.50 to 16.00
Mixed bor. & turn.....	14.50 to 15.00
Cast iron borings	14.50 to 15.00
Cast iron carwheels....	19.50 to 20.00
Hvy. breakable cast....	16.00 to 16.50
No. 1 cast	20.00 to 20.50
RR. knuckles & cplrs..	27.00 to 27.50
Rail coil & leaf springs	27.00 to 27.50
Rolled steel wheels....	27.00 to 27.50
Low phos. billet crops.	27.50 to 28.00
Low phos. sh. bar	27.00 to 27.50
Low phos. punchings..	25.00 to 25.50
Low phos. plate, hvy...	26.50 to 27.00
Low phos. plate clip..	25.00 to 25.50
Steel car axles	26.00 to 26.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$21.00 to $21.50
No. 2 hvy. mltng. steel.	19.50 to 20.00
Comp. sheet steel	20.00 to 20.50
Light bund. stampings.	16.50 to 17.00
Drop forge flashings...	19.50 to 20.00
Machine shop turn....	13.50 to 14.00
Short shov. turn.....	15.00 to 15.50
No. 1 busheling	20.00 to 20.50
Steel axle turnings....	17.50 to 18.00
Low phos. billet and bloom crops	26.00 to 26.25
Cast iron borings	14.50 to 15.00
Mixed bor. & turn. ...	14.50 to 15.00
No. 2 busheling	14.50 to 15.00
No. 1 cast	20.50 to 21.00
Railroad grate bars...	12.00 to 12.50
Stove plate	10.00 to 10.50
Rails under 3 ft.	24.50 to 25.00
Rails for rolling	21.50 to 22.00
Railroad malleable ...	21.00 to 21.50
Cast iron carwheels....	18.50 to 19.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$20.00 to $20.50
No. 2 hvy. mltng. steel.	18.50 to 19.00
Hydraulic bund., new.	19.00 to 19.50
Hydraulic bund., old..	..... 17.00
Steel rails for rolling..	22.00 to 23.00
Cast iron carwheels ..	20.00 to 22.00
Hvy. breakable cast ..	19.50 to 20.00
No. 1 cast	22.00 to 22.50
Stove plate (steel wks.)	16.50 to 17.00
Railroad malleable	19.50 to 20.00
Machine shop turn....	14.00 to 14.50
No. 1 blast furnace	13.50 to 14.00
Cast borings	13.50 to 14.00
Heavy axle turnings..	18.00 to 18.50
No. 1 low phos. hvy....	25.00 to 25.50
Couplers & knuckles..	25.00 to 25.50
Rolled steel wheels ...	25.00 to 25.50
Steel axles	25.00 to 25.50
Shafting	24.00 to 24.50
No. 1 RR. wrought ...	..... 20.00
Spec. iron & steel pipe	17.50 to 18.00
No. 1 forge fire	17.50 to 18.00
Cast borings (chem.).	13.50 to 14.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$21.50 to $22.00
Auto. hvy. mltng. steel.	19.50 to 20.00
Alloy free	19.00 to 19.50
Shoveling steel	21.50 to 22.00
Hydraul. comp. sheets.	20.50 to 21.00
Drop forge flashings...	17.50 to 18.00
No. 1 busheling	19.00 to 19.50
Rolled carwheels	23.00 to 23.50
Railroad tires, cut	23.50 to 24.00
Railroad leaf springs ..	23.50 to 24.00
Steel coup. & knuckles	23.50 to 24.00
Axle turnings	19.00 to 19.50
Coil springs	25.50 to 26.00
Axle turn. (elec.)	22.00 to 22.50
Low phos. punchings..	24.25 to 24.75
Low phos. plates, 12 in. and under	24.25 to 24.75
Cast iron borings	12.75 to 13.25
Short shov. turnings..	12.75 to 13.25
Machine shop turn. ...	11.50 to 12.00
Rerolling rails	23.50 to 24.00
Steel rails under 3 ft...	23.25 to 23.75
Steel rails under 2 ft...	25.00 to 25.50
Angle bars, steel	24.50 to 25.00
Cast iron carwheels ...	21.50 to 22.00
Railroad malleable	23.00 to 23.50
Agric. malleable	18.75 to 19.25
Iron car axles	26.50 to 27.00

	Per Net Ton
Steel car axles	$24.50 to $25.00
No. 1 RR. wrought....	19.25 to 19.75
No. 2 RR. wrought....	19.25 to 19.75
No. 2 busheling, old..	9.00 to 9.50
Locomotive tires	19.50 to 20.00
Pipes and flues	14.50 to 15.00
No. 1 machinery cast..	18.00 to 18.50
Clean auto. cast	16.50 to 17.00
No. 1 railroad cast	16.75 to 17.25
No. 1 agric. cast	14.50 to 15.00
Stove plate	12.50 to 13.00
Grate bars	14.00 to 14.50
Brake shoes	14.00 to 14.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	$21.00 to $21.50
No. 2 hvy. mltng. steel.	19.50 to 20.00
Scrap rails	21.00 to 21.50
New hvy. b'ndled sheet	19.50 to 20.00
Old hydraul. bundles ..	18.50 to 19.00
Drop forge flashings ..	19.50 to 20.00
No. 1 busheling	19.50 to 20.00
Hvy. axle turnings....	15.50 to 16.00
Machine shop turn.	15.00 to 15.50
Knuckles & couplers..	23.50 to 24.00
Coil & leaf springs....	23.50 to 24.00
Rolled steel wheels....	23.50 to 24.00
Low phos. billet crops.	24.00 to 25.00
Shov. turnings	15.50 to 16.00
Mixed bor. & turn.	13.50 to 14.00
Cast iron borings	13.50 to 14.00
Steel car axles	22.00 to 22.50
No. 1 machinery cast..	19.50 to 20.00
No. 1 cupola cast.....	18.50 to 19.00
Stove plate	15.50 to 16.00
Steel rails under 3 ft...	24.00 to 25.00
Cast iron carwheels...	19.00 to 19.50
Railroad malleable	21.50 to 22.50
Chemical borings	14.50 to 15.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$15.00 to $18.00
Scrap steel rails	17.00 to 19.00
Short shov. turnings..	9.00 to 10.00
Stove plate	9.00 to 10.50
Steel axles	18.00 to 19.00
Iron axles	16.50 to 18.00
No. 1 RR. wrought....	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 17.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:

Selected hvy. steel...	$18.50 to $19.00
No. 1 hvy. melting....	18.00 to 18.50
No. 2 hvy. melting....	16.00 to 16.50
No. 1 locomotive tires.	20.00 to 20.50
Misc. stand.-sec. rails.	19.00 to 19.50
Railroad springs	21.50 to 22.00
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought ...	18.00 to 18.50
No. 1 busheling	14.00 to 14.50
Cast bor. & turn.	7.50 to 8.00
Rails for rolling	20.00 to 20.50
Machine shop turn....	9.00 to 9.50
Heavy turnings	14.00 to 14.50
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	15.50 to 16.00
Steel rails under 3 ft. ..	20.00 to 20.50
Steel angle bars	19.25 to 19.75
Cast iron carwheels...	19.00 to 19.50
No. 1 machinery cast.	15.00 to 15.50
Railroad malleable ...	19.50 to 20.00
No. 1 railroad cast ...	15.00 to 15.50
Stove plate	12.50 to 13.00
Agricul. malleable	12.50 to 13.00
Grate bars	12.00 to 12.50
Brake shoes	13.50 to 14.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$18.75 to $19.25
No. 2 hvy. mltng. steel.	16.75 to 17.25
Scrap rails for mltng...	22.00 to 22.50
Loose sheet clippings ..	14.50 to 15.00
Bundled sheets	16.50 to 17.00
Cast iron borings	12.00 to 12.50
Machine shop turn.....	12.75 to 13.25
No. 1 busheling	16.00 to 16.50
No. 2 busheling	10.50 to 11.00
Rails for rolling	23.50 to 24.00
No. 1 locomotive tires..	18.00 to 18.50
Short rails	24.00 to 24.50
Cast iron carwheels ..	18.50 to 19.00
No. 1 machinery cast ..	18.00 to 18.50
No. 1 railroad cast	17.00 to 17.50
Burnt cast	12.50 to 13.00
Stove plate	12.50 to 13.00
Agricult. malleable	18.00 to 18.50
Railroad malleable	19.50 to 20.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$17.75 to $18.25
No. 2 hvy. mltng. steel.	16.75 to 17.25
Borings and turnings.	13.50 to 14.00
Long turnings	13.50 to 14.00
Short shov. turnings.	14.50 to 15.00
No. 1 machinery cast..	17.25 to 17.75
Automotive cast	18.50 to 19.00
Hydraul. comp. sheets.	19.25 to 19.75
Stove plate	11.25 to 11.75
New factory bushel...	17.50 to 18.00
Old No. 2 busheling..	11.75 to 12.25
No. 2 busheling (black fender stock)	13.00 to 13.50
Sheet clippings	14.00 to 14.50
Flashings	16.00 to 16.50
Low phos. plate scrap.	19.00 to 19.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$22.50 to $23.00
Hydraulic bundles ...	22.00 to 22.50
Machine shop turn ..	15.50 to 16.00

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$17.50 to $18.00
No. 2 hvy. mltng. steel.	16.00 to 16.50
Hvy. breakable cast..	15.50 to 16.00
No. 1 machinery cast...	16.75 to 17.25
No. 2 cast	15.00 to 15.50
Stove plate	13.00 to 13.50
Steel car axles.....	25.00 to 26.00
Shafting	20.00 to 20.50
No. 1 RR. wrought...	17.50 to 18.00
No. 1 wrought long...	16.50 to 17.00
Spec. iron & steel pipe	14.50 to 15.00
Rails for rolling.....	18.50 to 19.00
Clean steel turnings...	8.75 to 9.25
Cast borings	10.00 to 10.50
No. 1 blast furnace	10.00 to 10.50
Cast borings (chem.)..	11.00 to 11.50
Unprepar. yard scrap.	10.50 to 11.00
Per gross ton, delivered local foundries:	
No. 1 machn. cast....	$18.00 to $18.50
No. 1 hvy. cast cupola.	15.50 to 16.00
No. 2 cast	14.50 to 15.00

Add 50c. to 75c. to above quotations to secure North Jersey prices.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$16.30 to $16.80
Scrap rails	16.30 to 16.80
No. 2 steel.....	15.25 to 15.75
Breakable cast	.... 14.50
Machine shop turn.....	9.50 to 10.50
Mixed bor. & turn.....	7.80 to 9.20
Bund. skeleton long....	13.50 to 13.75
Shafting	19.00 to 19.50
Cast bor. chemical....	9.50 to 10.25
Per gross ton delivered consumers' yards:	
Textile cast	$17.00 to $19.00
No. 1 machine cast...	17.00 to 19.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton

	Toronto	Montreal
No. 1 hvy. mltng. stl...	$13.50	$13.00
No. 2 hvy. mltg. stl...	12.50	12.00
Mixed dealers steel....	12.00	11.75
Scrap pipe	10.25	9.75
Steel turnings	9.00	8.50
Cast borings	9.75	9.50
Machinery cast	17.50	17.00
Dealers cast	15.50	15.00
Stove plate	13.00	12.75

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges.

No. 1 hvy. mltng. steel.	$17.00 to $17.50
No. 2 hvy. mltng. steel.	16.00 to 16.50
No. 2 cast	15.50 to 16.00
Stove plate	12.50 to 13.00
Steel rails (scrap) ...	17.50 to 18.00

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	$17.00 to $17.50
No. 2 hvy. mltng. steel.	16.00 to 17.00
Rails (scrap)	17.00 to 17.50
Stove plate	12.50 to 13.00
No. 2 cast	14.75 to 15.00

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.	$18.50
No. 2 hvy. mltng. steel.	17.50

New Orleans, f.a.s., Stuyvesant Dock

No. 1 hvy. mltng. steel.	$17.50
No. 2 hvy. mltng. steel.	16.50

Los Angeles, on cars or trucks at local piers

No. 1 hvy. mltng. steel.	$10.50 to $11.00
Compressed bundles ..	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	48.00
F.o.b. Worcester, Mass.	49.00
F.o.b. Birmingham	50.00
F.o.b. San Francisco	56.00
F.o.b. Galveston	53.00

Rods over 9/32 in. to 47/64 in., inclusive, $5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.45c.
F.o.b. Chicago or Gary	2.50c.
F.o.b. Duluth	2.60c.
Del'd Detroit	2.60c.
F.o.b. Cleveland	2.50c.
F.o.b. Buffalo	2.55c.
Del'd Philadelphia	2.74c.
Del'd New York	2.78c.
F.o.b. Birmingham	2.60c.
F.o.b cars dock Gulf ports	2.85c.
F.o.b. cars Pacific ports	3.00c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	2.30c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
F.o.b. Buffalo	2.40c.
F.o.b. Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.85c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributers

F.o.b. Pittsburgh	2.55c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.60c.
Del'd Detroit	2.70c.
F.o.b. cars dock Gulf ports	2.95c.
F.o.b. cars dock Pacific ports	2.95c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.40c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.80c.
F.o.b. cars dock Pacific ports	2.80c.

Iron

F.o.b. Chicago	2.40c.
F.o.b. Pittsburgh (refined)	3.60c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.90c.
F.o.b. Cleveland, Chicago and Gary	2.95c.
F.o.b. Buffalo	3.00c.
F.o.b. Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Gary	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Coatesville or Spar. Pt.	2.35c.
Del'd Philadelphia	2.435c.
Del'd New York	2.53c.
F.o.b. Birmingham	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.
Wrought iron plates, f.o.b. Pittsburgh	3.80c.

Floor Plates

	Base per Lb.
F.o.b. Pittsburgh	3.80c.
F.o.b. Chicago	3.85c.
F.o.b. Coatesville	3.90c.
F.o.b. cars dock Gulf ports	4.20c.
F.o.b. cars dock Pacific ports	4.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago	2.30c.
Del'd Cleveland	2.435c.
F.o.b. Buffalo or Bethlehem	2.35c.
Del'd Philadelphia	2.455c.
Del'd New York	2.5025c.
F.o.b. Birmingham (standard)	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Chicago or Buffalo	2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports	3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb.	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	2.40c.
No. 10, f.o.b. Gary	2.50c.
No. 10, del'd Detroit	2.60c.
No. 10, del'd Philadelphia	2.69c.
No. 10, f.o.b. Granite City	2.60c.
No. 10, f.o.b. Birmingham	2.55c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.
No. 10 wrought iron, Pgh.	4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	3.15c.
No. 24, f.o.b. Gary	3.25c.
No. 24, del'd Detroit	3.35c.
No. 24, del'd Philadelphia	3.44c.
No. 24, f.o.b. Granite City	3.35c.
No. 24, f.o.b. Birmingham	3.30c.
No. 24, f.o.b, cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pittsburgh	5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	3.10c.
No. 10 gage, f.o.b. Gary	3.20c.
No. 10 gage, f.o.b. Detroit	3.30c.
No. 10 gage, del'd Philadelphia	3.39c.
No. 10, f.o.b. Granite City	3.30c.
No. 10 gage, f.o.b. Birmingham	3.25c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.55c.
No. 20 gage, f.o.b. Gary	3.65c.
No. 20 gage, del'd Detroit	3.75c.
No. 20 gage, del'd Philadelphia	3.84c.
No. 20, f.o.b. Granite City	3.75c.
No. 20 gage, f.o.b. Birminham	3.70c.
No. 20 gage, f.o.b. cars, dock, Pacific ports	4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.80c.
No. 24, f.o.b. Gary	3.90c.
No. 24, del'd Philadelphia	4.09c.
No. 24, f.o.b. Granite City	4.00c.
No. 24, f.o.b. Birmingham	3.95c.
No. 24, f.o.b. cars, dock, Pacific ports	4.40c.
No. 24, wrought iron, Pittsburgh	6.10c.

Electrical Sheets
(F.o.b. Pittsburgh)

	Base per Lb
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.
Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars, dock, Pacific ports	4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.50c.
No. 20, f.o.b. Gary	3.60c.
No. 20, f.o.b. Granite City	3.70c.
No. 20, f.o.b. cars dock Pacific ports	4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.	3.30c.
No. 28, Gary	3.40c.
No. 28, f.o.b. Granite City	3.50c.
No. 28, cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$4.85
Standard cokes, f.o.b. Gary	4.95
Standard coke, f.o.b. Granite City	5.05

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

	Per Base Box
F.o.b. Pittsburgh	*$4.15
F.o.b. Gary	* 4.25
F.o.b. Granite City	4.35

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937

Terne Plate
(F.o.b. Pittsburgh)
(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$11.00
15-lb. coating I.C.	13.00
20-lb. coating I.C.	14.00
25-lb. coating I.C.	15.00
30-lb. coating I.C.	16.25
40-lb. coating I.C.	18.50

Hot-Rolled Hoops, Bands, Strip and Flats under ¼ In.

	Base per Lb
All widths up to 24 in., Pittsburgh	2.40c.
All widths up to 24 in., Chicago	2.50c.
All widths up to 24 in., del'd Detroit	2.60c.
All widths up to 24 in., Granite City	2.60c.
All widths up to 24 in., Birmingham	2.55c.
Cooperage stock, Pittsburgh	2.50c.
Cooperage stock, Chicago	2.60c.

Cold-Rolled Strip*

	Base per Lb.
F.o.b. Pittsburgh	3.20c.
F.o.b. Cleveland	3.20c.
Del'd Chicago	3.48c.
F.o.b. Worcester	3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	3.20c.	3.40c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon	Over 1.00	8.50c.	8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.45c.
No. 20, Pittsb'gh or Cleveland	3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb
Bright wire	2.90c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	2.75c.
Smooth coated nails	2.75c.

	Base per 100 Lb.
Annealed fence wire	$3.20
Galvanized fence wire	3.60
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column	74
Single loop bale ties, base col.	63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel			*Wrought Iron*		
In.	Black	Galv.	In.	Black	Galv.
⅛	52	31	¼ & ⅜	+6	+26
¼ to ⅜	55	38½	½	27	10½
½	59½	49	¾	32	16
¾	62½	53	1 & 1¼	35	21
1 to 3	64½	55	1½	39	23½
			2	38½	23

Lap Weld

2	57	47½	2	32½	18
2½ & 3	60	50½	2½ to 3½	33½	20½
3½ to 6	62	52½	4 to 8	35½	24
7 & 8	61	50½	9 to 12	28½	15
9 & 10	60½	50			
11 & 12	59½	49			

Butt Weld, extra strong, plain ends

⅛	50½	36½	¼ & ⅜	+7	+39
¼ to ⅜	52½	40½	½	28	13
½	57½	48½	¾	33	18
¾	61½	52½	1 to 2	39	24½
1 to 3	63	55			

Lap Weld, extra strong, plain ends

2	55	46½	2	35½	21½
2½ & 3	59	50½	2½ to 4	41	28½
3½ to 6	62½	54	4½ to 6	40½	28
7 & 8	61½	51	7 & 8	41½	28½
9 & 10	60½	50	9 to 12	32	20½
11 & 12	59½	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 9.46	$ 8.41
1¼ in. o.d.	13 B.W.G.	11.21	9.96
1½ in. o.d.	13 B.W.G.	12.38	11.00
1¾ in. o.d.	13 B.W.G.	14.09	12.51
2 in. o.d	13 B.W.G.	15.78	14.02
2¼ in. o.d.	13 B.W.G.	17.60	15.63
2¼ in. o.d.	12 B.W.G.	19.37	17.21
2½ in. o.d.	12 B.W.G.	21.22	18.85
2¾ in. o.d.	12 B.W.G.	22.49	19.98
3 in. o.d.	12 B.W.G.	23.60	20.97
4½ in. o.d.	10 B.W.G.	45.19	40.15
3½ in. o.d.	11 B.W.G.	29.79	26.47
4 in. o.d.	10 B.W.G.	36.96	32.83
5 in. o.d.	9 B.W.G.	56.71	50.38
6 in. o.d.	7 B.W.G.	87.07	77.35

Extra for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
4-in., f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	59.00

Class "A" and gas pipe, $3 extra.
4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $41, Birmingham, and $49.50, delivered Chicago; and 4-in. pipe, $44, Birmingham, and $52.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. x 6 in. and smaller	65 and 5*
Larger and longer up to 1 in.	60 and 10*
1⅛ in. and larger	60 and 5*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3, and 7	65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex, blank or tapped:	
½ in. and smaller	65 and 5*
9/16 in. to 1 in. inclusive	60 and 10*
1⅛ in. and larger	60 and 5*

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:	
½ in. and smaller	60 and 20
9/16 in. to 1 in. inclusive	60 and 15
1⅛ in. and larger	60 and 12½
Stove bolts in packages, nuts attached	72½
Stove bolts in packages, with nuts separate	72½ and 5
Stove bolts in bulk	81½

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets

(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70
F.o.b. Cleveland	70
F.o.b. Chicago and Birmingham	70

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base 3.00c.
Delivered, Detroit 3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	$1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

	Base Per Lb
High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb higher. West of Mississippi quotations are 3c a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£15
Tin plate, per base box	24s. to 25s.
Steel bars, open-hearth	£9 5s.
Beams, open-hearth	£9 2s. 6d.
Channels, open-hearth	£9 2s. 6d.
Angles, open-hearth	£9 2s. 6d.
Black sheets, No. 24 gage	£13
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Metric Ton, Gold £, f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£3
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£5
Sheet bars	£3 1s.
Plate ¼ in. and up	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, ⅛ in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Base per Lb.
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$4.48
Spikes, large .....1 to 24 kegs	3.90c.

	Per Cent Off List
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district

**Prices on application.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.10c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	3.95c.
Hot-rolled annealed sheets (No. 24)	4.35c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	5.10c.

	Per Cent Off List
Machine bolts	*65
Carriage bolts	*65
Lag screws	*65
Hot-pressed nuts, sq. tap or blank	*65
Hot-pressed nuts, hex. tap or blank	*65
Hex. head cap screws	60
Cut point set screws	75 and 10
Flat head bright wood screws	62 and 20
Spring cotters	55
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	$4.55
Com. wire nails, 15 kegs or more	Prices on application
Cement c't'd nails, 15 kegs or more	Prices on application

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants wihtin the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	6.50c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled; strip, soft and quarter hard	3.92c.
Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.82c.
Galvanized sheets (No. 24*)	5.72c.
Long terne sheets (No. 24)	6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ⅛ in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.11c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	$3.40

	Per Cent Off List
Machine bolts, square head and nut: All diameters. Prices on application	
Carriage bolts, cut thread: All diameters. Prices on application	

* No. 28 and lighter, 36 in. wide 20c. higher per 100 lb.

† 125 lb. and more.

ST. LOUIS *Base per Lb.*

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24)*	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	4.94c.
Boiler rivets	5.04c.

	Per Cent Off List
Tank rivets, 7/16 in. and smaller.	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb
*Plates, ¼-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
‡Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, ¼ in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.
‡Reinforc. steel bars	2.60c.
†Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'l'd wire, per 100 lb.	$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95

	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count ½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

‡Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI *Base per Lb*

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles.	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload.	3.04
Cement c't'd nails, base 100-lb keg	3.50
Chain. lin. per 100 lb.	8.35

	Net per 100 Ft
Seamless steel boiler tubes, 2-in.	$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO *Base per Lb*

Plates	3.92c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON *Base per Lb*

Channels, angles	4.20c.
Tees and zees, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier	4.08c
Floor plates, diamond pattern.	6.03c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	4.31c.
Boiler rivets, cone head (keg lots)	4.31c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.	3.90c.
Com. wire nails and cement coated nails	
1 to 14 kegs	3.00c.
15 kegs or more	2.90c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller	65-10
Larger	65
Coach and lag screws	65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.60c.
Structural shapes	3.70c.
Plates	3.70c.
Cold-finished bars	4.20c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	5.10c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	3.85c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.11c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.80c.
Bands	3.85c.
Hoops	4.10c.
Special threading steel	3.95c.
Checkered floor plates ¼ in. and heavier	5.90c.
Galvanized bars, bands and small shapes	6.35c.
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

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* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.14c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.10c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$3.30
Bolts and nuts, per cent off list	65

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel			
Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	$3.65	$3.60	$3.70

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$54.00
High-heat duty, New Jersey	56.00
High-heat duty, Ohio	44.00
Intermediate, Pennsylvania Maryland, Kentucy, Missouri and Illinois	49.00
Intermediate, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester, Pa.	$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	42.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	21.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$28.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.50

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$95.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$30.00
F.o.b. New Orleans	30.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 6.00 to 6.50%	$28.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50%	$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.35
Ferrotungsten, lots of 5000 lb.	1.40
Ferrotungsten, smaller lots	1.45
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.
Ferrochromium, 2% carbon	16.50 to 17.00c.
Ferrochromium, 1% carbon	17.50 to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	$2.00
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3%	95.00
2.50% carbon grade	100.00
2% carbon grade	105.00
1% carbon grade	115.00

Note: Spot prices are $5 a ton higher except on 75 per cent ferrosilicon on which premium is $10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	13.50c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	10.00c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	34c.
Man., African, Indian, 44-48%	25c. to 30c.
Man., African, Indian, 49-51%	30c.
Man., Brazilian, 46 to 48½%	Nominal..25c. to 30c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	$18.00 to $18.50
Tungsten, domestic, scheelite delivered, nominal	$18.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per net ton:	
South African	$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	25.00
Turkish, 48-49%	24.50 to $25.00
Turkish, 45-46%	20.50 to 21.00
Turkish, 44%	19.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
52%	$25.50 to $26.00
50%	24.50
48-49%	24.50 to 25.00

FLUORSPAR *Per Net Ton*

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$19.00 to $20.00
Domestic, barge and rail	$19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	$20.00 to 21.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL *Per Gal.*

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	4.25c.
Del'd Ch'go, No. 5 industrial	3.90c.
Del'd Cleve'd, No. 3 distillate	6.00c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke *Per Net Ton*

Furnace, f.o.b. Connellsville, Prompt	$4.25 to $4.35
Foundry, f.o.b. Connellsville, Prompt	4.50 to 5.80
Foundry, by-product, Chicago ovens	9.00
Foundry, by-product, del'd New England	12.00
Foundry, by-product, del'd Newark or Jersey City	9.60 to 10.05
Foundry, by-product, Philadelphia	9.85
Foundry, by-product, delivered Cleveland	10.25
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal *Per Net Ton*

Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . New Chevrolet plant at Buffalo will cost, with equipment, $11,000,000; equipment orders being issued.

o o o

. . . Railroad purchases at Chicago dominate the market; inquiries and sales good in all markets.

o o o

. . . Price trend is higher, as costs rise; delivery situation shows no improvement.

Detroit

ANNOUNCEMENT of plans for the construction of a new axle and motor plant at Buffalo by the Chevrolet Division of General Motors Corp. was the highlight of the week in the local machinery market. Production of 1200 units a day will add 20 per cent to the Flint motor line capacity and will involve an expenditure of about $11,000,000 for plant and machinery. Already proposals are being made for machinery to be installed in this plant. It also seems fairly certain that General Motors will erect a plant in the Redford section of Detroit for the manufacture of a truck diesel and fuel injection parts for the Winton engine. Already considerable machinery has been lined up for installation originally at the Cadillac plant. Cadillac itself has been active in the market and has placed a number of orders during the past week for equipment for machining blocks and engine details. The Pontiac Division of General Motors has begun an extensive buying program to increase production approximately 30 per cent on the motor line.

Even before the sit-down strikers evacuated the Chrysler plants, several of the master mechanics had been issuing orders in considerable volume for production machinery for 1938 models. Activity centered at the home of William H. Smila, master mechanic of the Jefferson Avenue plant, in connection with a program designed to increase production of the six-cylinder engine used in both DeSoto and Chrysler cars.

Cleveland

THE machinery market is only moderately active. Dealers report some falling off in sales and a decrease in inquiries. Prospective buyers are showing hesitancy about placing orders. However, March has been a satisfactory month with most machine tool manufacturers. Sales by a leading maker of turret lathes increased 15 per cent or more this month over February. A good volume of inquiry has developed for drilling machinery, which has been quiet recently, largely because of absence of orders from the automotive industry. Prices are showing an upward trend. Advances of 5 to 10 per cent on April 1 have been announced by some manufacturers of lathes, drilling machines, shapers and milling machines.

Chicago

RAILROAD purchases are looming large at a time when caution, because of labor disturbances and general uncertainties, is taking a grip on other types of industries. The Burlington is in the market for 25 items, with total value over $100,000, and the Union Pacific is inquiring for 20 machine tools worth in excess of $125,000. Dealers point to economic disturbances for the drop of March sales, which had been counted on to make an excellent showing. Numerous concerns are already laying plans for 1938 requirements and will buy their needs at the first sign of improved labor conditions. Announcements of machine tool price advances are of almost daily occurrence.

Pittsburgh

INQUIRIES continue strong and are equally as good as a week ago. Orders have stepped up slightly and, with higher labor costs and shortage of skilled workmen, it is not expected that any leveling off of machine tool orders will occur in the near future. Although the matter of price and delivery has driven some customers to do forward buying, nevertheless the underlying reason for the normal volume of business is to be found in the heavy ultimate consumption of manufacturers' products. Many customers have been so busy with their own interests that they are just now coming to a realization that complete modernization of their machine tool set-up is a necessity if they are to remain in a competitive position. Meanwhile, deliveries continue to become further extended.

New York

MARCH appears to have been the best month for most machine tool sellers since December, which broke sales records for many a year. Inquiries have been reported from the New York Central and the New Haven. A good many tools of various sorts, drills, planers, lathes, etc., are being purchased by the Worthington Pump & Machinery Corp. for its Holyoke, Mass., plant which is being reopened after several years of inactivity. Builders are still undecided as to what procedure to follow regarding prices. At least one company that advanced prices in December has boosted quotations again, and some others are expected to follow suit in the near future. Selling on the basis of price at time of shipment, though it permits builders with heavy backlogs to reassure themselves to some extent of ample remuneration at time of delivery, since subsequent increases in labor and materials would thus be taken into consideration, is not altogether satisfactory because of the possibility, rare though it may be, that business might be so poor that prices would take a sudden drop, leaving sellers with high-priced tools to be sold at below-cost levels. It is believed that the only way to overcome this difficulty is to raise prices at the outset, thus insuring a sufficient margin to allow additional costs to be added without eating into profits.

Cincinnati

MACHINERY demand in this area has eased a trifle without any definitely assignable cause. Some members of the trade feel that delivery problems are largely responsible, but no proof is obtainable. Of course, factories are operating at the highest rate commensurate with the supply of skilled labor. This places the average at about 85 per cent of full capacity. Business, however, is at good rate, with heavy tools least affected by the slight drop in current ordering. Several multiple-unit orders for milling machines and grinders from undisclosed sources were reported. In addition, foreign as well as domestic users are consistently in the market, with reports of activity from airplane manufacturers. Rehabilitation of patterns damaged by flood is being rapidly completed, and only a small percentage of castings are now being delayed because of lack of patterns.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Southern Kraft Corp., 220 East Forty-second Street, New York, plans new pulp and paper mill on site now being selected in South, with power house, pumping station, machine shop and other mechanical units. Cost over $7,000,000 with machinery. Completion is scheduled early in 1938. Company has work under way on similar mill at Georgetown, S. C., to cost close to same amount, which is expected to be completed in October. Company is a subsidiary of International Paper Co., first noted address.

Strickland Foundry & Machine Works, Inc., 516 West Thirty-sixth Street, New York, has leased for expansion one-story building, 50 x 100 ft., to be erected at 581-83 Eleventh Avenue, by Red Rock Realty Corp.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until April 15 for 38,000 ft. of cable and five reels (Circular 147).

Board of Education, Park Avenue and Fifty-ninth Street, New York, plans installation of manual training department in new four-story high school, 191 x 421 ft., on Astor Avenue, Bronx, for which superstructure will begin soon. Cost about $2,000,000. Walter C. Martin, Flatbush Avenue Extension and Concord Street, Brooklyn, is architect for board.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 6 for quantity of wire-bristle brushes for boiler-tube cleaning outfits (Schedule 269) for Brooklyn Navy Yard; universal joints (Schedule 302) for Brooklyn and Philadelphia yards.

National Biscuit Co., 449 West Fourteenth Street, New York, plans one-story factory branch, storage and distributing plant on Teall Avenue, Syracuse, N. Y. Cost over $120,000 with equipment. Company is also planning additions to folding paper box and shipping container plant at Marseilles, Ill. Cost close to $850,000 with equipment.

Department of Parks, Arsenal Building, Central Park, New York, has filed plans for one-story equipment storage, maintenance and repair building, 136 x 136 ft., at Rockaway Park, Queens Borough. Cost about $50,000 with equipment. Aymar Embury, 150 East Sixty-first Street, New York, is architect.

American Light & Traction Co., 52 William Street, New York, operating electric light and power plants in different parts of country, has authorized fund of $5,763,000 for expansion and improvements in power plants, transmission and distributing lines, and other properties. Company is a subsidiary of United Light & Power Co., 105 West Adams Street, Chicago.

Port of New York Authority, 111 Eighth Avenue, New York, asks bids until April 13 for ventilation building for West Seventy-eighth Street vehicular tunnel. Frank C. Ferguson is chairman.

Wright Aeronautical Corp., Paterson, N. J., manufacturer of aircraft engines and parts, has plans for four-story addition, 65 x 205 ft. Cost close to $275,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Coca-Cola Co., Atlanta, Ga., which will build a branch plant at Kearny, N. J., as announced in March 25 issue, p. 129, has awarded general contract to James Stewart & Co., 230 Park Avenue, New York, instead of to Stuart Construction Co., 516 Fifth Avenue, New York, as previously stated.

Signal Property Officer, Signal Corps Laboratories, Fort Monmouth, Oceanport, N. J., asks bids until April 8 for six to 14 gasoline engine-driven power units (Circular 10).

American Transformer Co., 172 Emmett Street, Newark, N. J., manufacturer of electrical transformers, parts, etc., has acquired tract of over one acre at 273-301 Emmett Street, and plans early erection of several one-story units to occupy entire site. Equipment will be installed to double present capacity.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until April 6 for one filing machine and bench (Proposal 526), one heavy-duty filing machine, pedestal type (Proposal 527).

New York & Pennsylvania Co., Lock Haven, Pa., has approved plans for two additions to local paper mill, two stories, 30 x 78 ft., and one story, 60 x 120 ft., respectively, first noted for expansion in paper-making division and latter structure primarily for storage and distribution. Company will also make improvements in power house, including installation of new equipment. Cost close to $100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 9 for one motor-driven universal bench saw (Schedule 318) for Philadelphia Navy Yard.

BUFFALO DISTRICT

Chevrolet Motor Co., East Delavan Avenue and Erie Railroad, Buffalo, is concluding arrangements for purchase of about 150 acres in Tonawanda Township for new plant for manufacture of automobile engines and parts, gears and axles, to furnish requirements for present assembling works at Buffalo, Tarrytown, N. Y., and Baltimore. Plant will consist of one-story units, totaling close to 500,000 sq. ft. floor space. A water terminal, 1400 ft. long, will be built for shipping and distribution. Cost close to $2,000,000 with equipment. Main offices of company are at 3044 West Grand Boulevard, Detroit.

Niagara Sprayer & Chemical Co., Van Gundia Street, Middleport, manufacturer of spraying and dusting machines and parts, chemical specialties, etc., has plans for one-story addition. Cost close to $50,000 with equipment.

WASHINGTON DIST.

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., asks bids until April 12 for one 2500-lb. electric-operated freight elevator installed complete (Circular 135); until April 15, one water-cooled air compressor, direct-connected to motor through flexible coupling (Circular 139).

Glenn L. Martin Co., Baltimore, manufacturer of airplanes and parts, is having revised plans prepared by Albert Kahn, Inc., New Center Building, Detroit, for proposed additions to plant, comprising main one-story unit, 300 x 450 ft., primarily for assembling; three-story laboratory, 48 x 78 ft., and other structures, including three-story office and administration building. Superstructure will begin about middle of April. Cost close to $2,000,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until April 8 for magnet wire, rubber-insulated wire, 50,000 ft. telephone wire, outlet boxes, wheelbarrows and other equipment (Schedule 3235).

Smith-Moore Vehicle Co., 408 North Fifth Street, Richmond, Va., manufacturer of automobile bodies, wagon equipment and parts, etc., has plans for new one-story plant at Roberts Street and Brook Road. Cost about $45,000 with equipment.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until April 19 for boring machines, gear pullers, valve lifters, condenser testers, wrenches, magnet charges, timing fixtures, etc. (Proposal 398-101).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 6 for one hand-operated portable wire-rope shear (Schedule 244), one motor-driven hydraulic press (Schedule 163), motors and brakes, motors, hoists and brakes, and control appliances (Schedule 240); until April 9, for exhaust valves and guides for aircraft engines (Schedule 900-503) for Eastern and Western Navy yards; two motor-driven metal-sawing machines (Schedule 323) for Yorktown, Va., yard; one heavy-duty engine lathe and one ammeter (Schedule 320) for Norfolk yard; copper-nickel alloy forgings and plungers (Schedule 283) for Washington yard; flexible bronze metallic hose for steam and fuel oil service (Schedule 279) for Sewall's Point, Brooklyn and Mare Island yards; universal joints for airplanes (Schedule 900-550) for Quantico, Va., yard; until April 13, five motor-driven oxygen transfer equipments (Schedule 282) for Newport News, Va., and Western yards.

SOUTH ATLANTIC

Atlantic Brewing Co., Charlotte, N. C., plans expansion and improvements, including one-story addition for storage and distribution. Cost close to $35,000 with equipment.

Contracting Officer, Fort Benning, Ga., asks bids until April 7 for natural gas regulators, burners, control equipment, meters, etc. (Proposal 148-85).

Americus Oil Co., Americus, Ga., plans rebuilding part of plant recently destroyed by fire. Loss about $60,000 with equipment.

City Council, Greensboro, N. C., Andrew Joyner, Jr., city manager, asks bids until April 5 for stokers and other mechanical equipment for Reedy Fork municipal water pumping station.

Cheerwine Bottling Co., 1510 South Mint Street, Charlotte, N. C., has let general contract to L. S. Bradshaw & Son, Salisbury, N. C., for one and two-story mechanical-bottling plant. Cost close to $40,000 with equipment.

WESTERN PA. DIST.

Stackpole Carbon Co., St. Marys, Pa., manufacturer of carbon products, lamp filaments, etc., has acquired plant and business of Johnsonburg Radio Tube Co., Johnsonburg, Pa., and will carry out expansion and improvements. Several one-story additions will be built. Plant will be continued for radio tube production and operated as a branch works. Cost over $65,000 with equipment.

Taylor Aircraft Co., Bradford, Pa., manufacturer of commercial airplanes and parts, plans early rebuilding of part of plant recently destroyed by fire. Loss over $150,000 with machinery.

Raymond City Coal & Transportation Corp., Carew Tower Building, Cincinnati, plans new coal-loading tipple and other handling facilities on Kanawha River at company harbor, Raymond City, W. Va. Tipple will be of steel, equipped with two belt conveyers and other barge-loading machinery. An ice breaker, also, will be built, comprising two rock-filled circular steel shells, 32 ft. in diameter.

SOUTHWEST

Central Motor Sales Co., 302 East McDaniel Street, Springfield, Mo., has let general contract to Chapman & Bramer, 925 Benton Street, for one-story machine shop, 75 x 77 ft. Cost about $30,000 with equipment. Earl Hawkins, McDaniel Building, is architect.

Purchasing and Contracting Officer, Quartermaster Corps, Field Artillery School, Fort Sill, Okla., asks bids until April 6 for 12 automatic boiler feed-water regulators, with low water cutoff (Proposal 841-107); until April 7, one gas-fired boiler and one natural gas-fired boiler (Proposal 841-106).

Blue Ridge Bottling Co., 1827 South Kingshighway, St. Louis, has asked bids on general contract for one-story and basement addition to mechanical-bottling plant, 25 x 160 ft., with L-extension, 30 x 50 ft. Cost over $65,000 with equipment.

St. Louis Independent Packing Co., 3815 Chouteau Avenue, St. Louis, meat packer, has let general contract to Lundoff-Bicknell Co., 100 North LaSalle Street, Chicago, for

plant extensions and improvements. Cost over $100,000 with equipment. Company is affiliated with Swift & Co., Chicago.

Reed Roller Bit Co., Houston, Tex., manufacturer of oil well equipment, plans shops, storage and distributing plants in recently developed oil field districts in State, with facilities for production, reconditioning and repairs, including parts manufacture. A one-story factory is planned for production of a line of plug valves. Entire project will cost close to $700,000. Financing has been authorized.

Socony Paint Products Co., Port Arthur, Tex., has plans for one-story addition to double present capacity. Cost close to $100,000 with machinery. W. M. Stanley is vice-president in charge.

NEW ENGLAND

Gardner Stove Co., 205 School Street, Gardner, Mass., has let general contract to Columbus & Berg, Inc., Gardner, for one and two-story addition, part of unit to be equipped as an enameling division. Cost over $100,000 with equipment. Frank D. Chase, Inc., 307 North Michigan Avenue, Chicago, is architect and engineer.

Snap-on-Tools, Inc., 510 Cambridge Street, Allston, Mass., manufacturer of tools and mechanical specialties, has let general contract to Dunn-Galvin Corp., 84 Portland Street, Boston, for one-story and basement plant unit, 70 x 80 ft., for expansion. Cost close to $40,000 with equipment.

Naragansett Brewing Co., Arlington Street, Providence, R. I., plans extensions and improvements in plant at Cranston, R. I. Cost close to $50,000 with equipment. E. M. Corbett, 49 Purchase Street, Fall River, Mass., is architect and engineer.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until April 20 for two horizontal hydraulic surface grinders, hydraulic table, 6 x 18 in. (Circular) 187, two vertical spindle, light type milling machines (Circular 188).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 6 for one motor-driven horizontal boring machine for Boston Navy Yard (Schedule 292).

SOUTH CENTRAL

Davis County Distillery Co., Owensboro, Ky., plans multi-story addition to distilling plant, primarily for storage and distribution. Cost over $60,000 with equipment.

Southern Bell Telephone & Telegraph Co., 215 Church Street, Nashville, Tenn., has let general contract to W. R. Smith & Son, Cotton States Building, for one-story service, repair and garage building, 130 x 170 ft., for company motor trucks and cars. Cost close to $100,000 with equipment.

Board of Education, Lexington, Ky., will install a machine shop woodworking shop and other manual training departments in new two-story high school on Tatescreek Pike, for which bids will be asked soon on general contract. Cost about $267,000. Financing has been arranged through Federal aid. L. K. Frankel and John J. Curtis, both Lexington, are architects.

United States Engineer Office, Vicksburg, Miss., asks bids until April 5 for rubber-covered electric wire, portable rubber-jacketed electric cable, weatherproof electric wire and electric welding cable (Circular 212); until April 6, 30 16-in. ball joints, complete with bolts and gaskets (Circular 215), 40 4-in., and 22 3-in. heavy-duty marine electric blowers, and 32 blower safety switches (Circular 213); until April 8, steel castings, including pump cases, suction throat wearing rings, pump impellers, suction head liner, steel suction elbow, steel discharge elbow, steel trunnion pipe, etc. (Circular 218); until April 9, 675 steel boiler tubes, 2-in. O.D. and 11 ft. 7½ in. long (Circular 219).

United States Engineer Office, Mobile, Ala., asks bids until April 6 for one set of three 1½-hp. internal vibrators for vibrating asphaltic concrete mix (Circular 380); until April 7, one caterpillar-mounted dragline, ½-yd. capacity, with internal combustion engine (Circular 381).

OHIO AND INDIANA

Shartle Brothers Machine Co., Clark Street, Middletown, Ohio, manufacturer of pulp and paper mill machinery and parts, has let general contract to F. K. Vaughn Building Co., First National Bank Building, Hamilton, Ohio, for one-story machine shop. Cost close to $45,000 with equipment.

Enterprise Aluminum Co., Massillon, Ohio, manufacturer of aluminum products, plans one-story addition, for storage and distribution. Cost about $40,000 with equipment.

Board of Education, 121 Southard Avenue, Toledo, Ohio, will ask bids soon on general contract for two and three-story vocational high school, 96 x 490 ft., at Monroe and Sixteenth Streets, to include 24 shop units. Cost about $1,600,000, of which approximately $350,000 will be expended for shop and mechanical equipment. Financing has been arranged in part through Federal aid. Edwin M. Gee is architect for board; R. S. Wenzlau is director of schools.

McGean Chemical Co., Republic Building, Cleveland, manufacturer of industrial chemicals, has let general contract to Sam W. Emerson Co., 1936 Euclid Avenue, for one-story and basement addition to plant at 2910 Harvard Avenue, 70 x 170 ft., with extension, 30 x 80 ft. Cost over $65,000 with equipment. C. B. Rowley & Associates, Keith Building, are architects; J. E. A. Moore, last noted address, is engineer.

Standard Oil Co. of Ohio, Midland Bank Building, Cleveland, has begun expansion and improvements at oil refinery, Toledo, to include new crude distilling and cracking units and other equipment for gasoline production, storage and distributing tanks and facilities, and other extensions. Cost about $2,000,000 with machinery.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until April 6 for two electric furnaces (Circular 625), cable assemblies, socket assemblies, printer frame clamp connecting rods, printer frame clamp trunnion screws, contact printer lid springs, gun camera control holder brackets, gun camera light shields, gun camera motor driving springs, etc. (Circular 622); until April 7, one air compressor (Circular 624).

Pierce Governor Co., Anderson, Ind., manufacturer of engine governors and kindred equipment, has asked bids on general contract for two-story addition, about 25,000 sq. ft. floor space. Cost over $50,000 with equipment.

Lilly Varnish Co., 666 South California Street, Indianapolis, has let general contract to Michaelis & McCahill, Inc., 542 Massachusetts Avenue, for four-story addition, 36 x 42 ft. Cost over $65,000 with equipment. Vonnegut, Bohn & Mueller, Indiana Trust Building, are architects.

MICHIGAN DISTRICT

Evans Products Co., Union Guardian Building, Detroit, manufacturer of automobile loading devices and equipment, has plans for one and two-story plant, 200 x 250 ft. Cost over $100,000 with equipment. Harley & Ellington, Inc., Stroh Building, is architect and engineer.

Metal Office Furniture Co., Grand Rapids, Mich., has let general contract to Osterink Construction Co., Grand Rapids, for one-story addition. Cost over $40,000 with equipment. Weemhoff & Steketee, Grand Rapids, are architects.

Ford Motor Co., Dearborn, Mich., has let general contract to Allen Construction Co., Ltd., Windsor, Ont., for one-story addition to branch plant at Windsor, 570 x 1000 ft., for expansion in assembling department, body-manufacturing division and other departments. Cost over $2,500,000 with machinery.

Crampton Mfg. Co., Holland, Mich., recently chartered with capital of $225,000 to manufacture tools, dies, die castings and kindred products, has taken over former plant of Szekely Aircraft Corp. for similar line of production. Expansion will be carried out in die casting and other divisions. Mr. Crampton is president, and A. O. Shafer, vice-president and works manager.

Holland Furnace Co., Holland, Mich., manufacturer of stoves and furnaces, parts, etc., has begun modernization and improvements at foundry on Fourth Street, formerly used by Burke Engineering Co. New equipment will be installed for production of furnace castings.

MIDDLE WEST

Roth Mfg. Co., 1600 South Kilbourn Avenue, Chicago, manufacturer of automobile parts and kindred equipment, has let general contract to Anderson & Winblad Co., 6235 South Michigan Avenue, for one-story plant unit, 147 x 159 ft. Cost over $65,000 with equipment. S. L. Reily, 300 West Adams Street, is architect.

A. B. Dick Co., 720 West Jackson Boulevard, Chicago, manufacturer of mimeograph machines and parts, and other duplicating machine appliances, will take bids soon on general contract for five-story addition. Cost close to $400,000 with equipment. Nimmons, Carr & Wright, 333 North Michigan Avenue, are architects.

National Gypsum Co., Fort Dodge, Iowa, manufacturer of building products, wallboard specialties, etc., has plans for three one-story additions, including wallboard mill to cost about $500,000 with machinery, plaster mill to cost approximately $300,000 with equipment, and gypsum block, storage and distributing plant to cost about $100,000 with equipment. Main offices of company are at Buffalo.

City Council, Pella, Iowa, asks bids until April 15 for extensions and improvements in municipal electric power plant, including 1000-kw. steam turbo-generator unit with accessories, surface condenser with circulating pumps and auxiliaries, steam boiler, chain grate stoker, forced-draft fan, cooling tower and accessory equipment. Young & Stanley, Inc., Muscatine, Iowa, is consulting engineer.

Armour & Co., Union Stock Yards, Chicago, have let general contract to V. Ray Gould, City National Bank Building, Omaha, Neb., for three additions to branch packing plant at South Omaha, six, four and three stories, respectively. Cost about $750,000 with equipment.

Bureau of Reclamation, Custom House, Denver, asks bids until April 5 for plate steel venturi meter tube and auxiliary equipment for outlet works at Caballo Dam, Rio Grande Project, New Mexico-Texas (Specifications 409-D); until April 9, telephone cable and rubber insulated cable (Specifications B-23259-A).

Air Devices Corp., 64 East Twenty-fifth Street, Chicago, manufacturer of air-conditioning and refrigerating machinery, automotive products, plans expansion, including new machinery and equipment, to cost about $100,000. Financing has been arranged.

PACIFIC COAST

Pacific Screw Products Corp., 7422 Compton Avenue, Los Angeles, has let general contract to Charles Gale, 3458 Centinela Street, for one-story addition, 40 x 85 ft. Cost close to $30,000 with equipment. H. Sage Webster, 517 North LaBrea Avenue, is architect.

Bercut-Richards Packing Co., North B and Seventh Streets, Sacramento, Cal., canner and food packer, has plans for two one-story additions, 240 x 320 ft., and 240 x 280 ft., respectively, for a canning plant, storage and distributing building, in order noted. Cost about $165,000 with equipment.

American Sheet Metal Works, Inc., N.E. Eleventh and Glisan Streets, Portland, Ore., has let general contract to A. J. Bingham & Son, Couch Building, for one-story plant to occupy entire block. Cost about $100,000, of which over one-half will be used for equipment purchases. Cash & Wolff, Railway Exchange Building, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 9 for one motor-driven flange-facing machine (Schedule 290), gasoline hose filters (Schedule 291) for Mare Island Navy Yard.

Menasco Mfg. Co., 6714 McKinley Avenue, Los Angeles, manufacturer of aircraft engines and parts, has purchased one-story building, about 45,000 sq. ft. of floor space, on McKinley Avenue and will remodel for expansion.

Gunderson Brothers Co., 9802 N.W. St. Helens Road, Portland, manufacturer of steel chassis for motor trucks, motor vans, etc., has plans for one-story addition, 30 x 103 ft. Cost close to $45,000 with equipment. Walter E. Kelly, Artisans' Building, is architect.

Boeing Airplane Co., 200 West Michigan Street, Seattle, is considering new one-story assembling works at plant on East Marginal Way, 200 x 300 ft., duplicating a unit built last fall. Cost over $350,000 with equipment.

Eastside Winery, Inc., Lodi, Cal., has plans for one-story addition, 38 x 115 ft. Cost about $35,000 with equipment. E. G. Ernst, 9 West Cleveland Street, Stockton, Cal., is architect.

FOREIGN

Lochaber Aluminum Co., Ltd., Fort William, Scotland, manufacturer of aluminum products, plans new additions to plant, comprising several one and multi-story units. Cost over $400,000 with equipment. Work is scheduled to begin soon.

Why the Railroads Should Buy Machine Tools

(CONTINUED FROM PAGE 49)

were replaced by 32 machines, with capacity maintained. These modern machines contributed considerably in reducing locomotive shopping time 27 per cent and in reducing repair costs 24 per cent. Here again the installation of modern machine tools and the revamping of shop methods took place simultaneously. A complete account of this modernization appeared in *Railway Mechanical Engineering* of June, 1936.

In the shop of another railroad, which was studied to determine the savings possible with modern machine tools, it was found that economies ranging from a small percentage on a few parts to well over 70 per cent on others could be effected. In the machining of axles a time saving of 51 per cent was indicated. New driving boxes could be finished with modern machine tools in 19 per cent of the former time—a saving of 81 per cent. Main rods could be machined completely in 45 per cent of the previous time, and cylinder packing rings in 73 per cent of the time. On a representative list of 11 parts, including driving boxes, axles, piston heads, cross-heads, an average time saving of 47 per cent could be effected through use of modern machine tools.

From these and other studies it is believed that a general saving of 15 to 25 per cent can be effected in the machine department of the average railroad shop through the installation of modern machine tools, and furthermore, that this saving would have a marked effect in lowering the repairing time in other departments and the shop as a whole.

Program Announced For A.S.M.E. Meeting

A BROAD survey of the modern technique employed by the mass-production industries as typified by the automobile builders will be discussed by such eminent authorities as William S. Knudsen, executive vice-president, General Motors Corp.; Edward G. Budd, president, Edward G. Budd Mfg. Co.; W. J. Cameron, The Ford Motor Co., and Everett Chapman, president, Lukenweld, Inc., at the semi-annual meeting of the American Society of Mechanical Engineers, to be held at the Statler Hotel, Detroit, May 17 to 21.

After the six general sessions which will be held on the mornings and evenings of Tuesday, Wednesday and Thursday, an address summarizing the implications of the week's program will be delivered by Col. Willard T. Chevalier, McGraw-Hill Publishing Co., at a dinner Thursday night.

Other sessions will discuss the following: Apprenticeship; machine shop practice; welding; relations with colleges; lubrication; materials handling; iron and steel; economics; cutting metals research; and railroads.

Arrangements have been made for engineers to visit the Detroit Edison Co., Springwells pumping station, Ford Motor Co., Plymouth plant of Chrysler Corp., the Cadillac and Chevrolet gear and axle plants of General Motors Corp., and the Great Lakes Steel Co.

Harvey N. Davis, president, Stevens Institute of Technology, is chairman of the committee in charge of the meeting.

A. S. T. M. Approves New Specifications

AT the large number of meetings of standing committees of the American Society for Testing Materials held in Chicago, March 1 to 4, a number of new specifications and tests were approved and will be submitted to the society at the annual meeting in June, subject to approval by confirming letter ballot of the respective committees. There were about 150 meetings throughout the week, including main standing committees, sections and subcommittees.

The total registration at the Chicago gathering was about 600. All of the meetings were very well attended and spirited discussion took place at several of them on important points.